

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 12,2 a1  
Edition : 30.10.92  
Replaces : 03.90  
Test oil : ISO-4113  
  
Combination no. : 0 401 846 382A  
  
Injection pump  
Pump designation : PE6P120A32ORS3206-1  
EP type number : 0 411 826 775  
Governor  
Governor design. : RQ750PA783-1  
Governor no. : 0 421 801 432

Customer-spec. information  
Customer : PENTA

Engine : TAMD 122

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness : 6.00x1.50x1000  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

A01

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 30.9...31.1

100 s: (30.6...31.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.5

100 s: (0.8)

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Del.quantity : 309.0...311.0

1000 : (306.0...314.0)

Spread cm3 : 5.00

1000 : (9.90)

## RATED SPEED

### 1st version

#### Testing:

1st rack travel in: 11.40

Speed rpm : 896...901

2nd rack travel in: 4.00

Speed rpm : 933...948

4th rack travel in: 1000

Speed rpm : 0.00...1.00

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.40

Speed rpm : 896...901

Remarks:

:

APPLICATION

Generator set

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 30.10.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 401 846 955  
Injection pump  
Pump designation : PE6P120A32ORS3196  
EP type number : 0 411 826 763  
Governor  
Governor design. : RQ200/1100PA998  
Governor no. : 0 421 801 614

Customer-spec. information  
Customer : SCANIA

Engine : DSC9 10

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00

A03

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 13.2...13.4

100 s: (12.9...13.7)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.6...5.0

Del.quantity cm3/ : 1.2...1.6

100 s: (-)

Spread cm3 : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.30

2nd speed rpm : 350

travel mm : 2.30...2.90

3rd speed rpm : 650

travel mm : 3.80...4.20

4th speed rpm : 1180

travel mm : 4.40...4.60

5th speed rpm : 1280

travel mm : 5.60...6.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 132.0...134.0

1000 : (129.0...137.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

##### 1st version

##### Setting point:

Speed rpm : 600  
Rack travel in mm : 16.5

##### Testing:

1st rack travel in: 9.50  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1265...1295  
4th rack travel in: 1380  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

##### Setting point w/out bumper spring

Speed rpm : 250  
Rack travel in mm : 4.7

##### Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 250  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...380

#### Aneroid/Altitude Compensator Test

##### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 10.50...10.60

##### Measurement

Speed 1/min : 500

##### 1st pressure hPa : -

Rack travel in m: 9.80...10.20

##### 2nd pressure hPa : 350

Rack travel in m: 10.20...10.30

##### 3rd pressure hPa : 320

Rack travel in m: 10.00...10.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

##### Aneroid pressure h: 900

Speed rpm : 1100

Del.quantity cm3/ : 128.0...136.0  
1000 s: (126.0...138.0)

##### Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 114.0...118.0  
1000 s: (112.0...120.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.50

Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.60...4.80

##### Remarks:

:

Delivery-valve spring pre-tension  
3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Two-part control lever.

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 30.10.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 401 846 956  
  
Injection pump  
Pump designation : PE6P120A320RS3196  
EP type number : 0 411 826 763  
Governor  
Governor design. : RQV200...1100PA729-4  
Governor no. : 0 421 813 950

Customer-spec. information  
Customer : SCANIA

Engine : DSC9 10

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 10.50...10.60

Del.quantity cm3/ : 13.2...13.4

100 s: (12.9...13.7)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.6...5.0

Del.quantity cm3/ : 1.2...1.6

100 s: (-)

Spread cm3 : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
travel mm : 0.70...1.10

2nd speed rpm : 350  
travel mm : 2.00...2.60

3rd speed rpm : 650  
travel mm : 4.90...5.50

4th speed rpm : 1145  
travel mm : 8.30...8.50

5th speed rpm : 1250  
travel mm : 9.20...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1120

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 132.0...134.0

1000 : (129.0...137.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 111...119

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1235...1265  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 250  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...380

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 10.50...10.60

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 350  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 320  
Rack travel in m: 10.00...10.20

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm3/ : 128.0...136.0  
1000 s: (126.0...138.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 114.0...118.0  
1000 s: (112.0...120.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 10.50...10.60

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VOL  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 401 846 968

Injection pump  
Pump designation : PE6P110A320RS3197  
EP type number : 0 411 816 752  
Governor  
Governor design. : RGV300...1100PA589-4  
Governor no. : 0 421 814 022

Customer-spec. information  
Customer : VME

Engine : TD102 KF

1st version kW : 200.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.90...12.00

Del.quantity cm<sup>3</sup>/ : 16.7...16.9

100 s: (16.4...17.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 4.4...4.8

Del.quantity cm<sup>3</sup>/ : 2.5...2.9

100 s: (2.2...3.2)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.00...1.40

2nd speed rpm : 350

travel mm : 2.20...2.70

3rd speed rpm : 450

travel mm : 3.70...4.10

4th speed rpm : 750

travel mm : 6.30...6.70

5th speed rpm : 1160

travel mm : 7.90...8.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1180

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1000

Del.quantity : 167.0...169.0

1000 : (164.0...172.0)

Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version

Control lever  
position degrees: 115...123

Testing:

1st rack travel in: 10.90

Speed rpm : 1160...1170

2nd rack travel in: 4.00

Speed rpm : 1225...1255

4th rack travel in: 1350

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 60...68

Testing:

Speed rpm : 100

Minimum rack travel: 5.90

Speed rpm : 300

Rack travel in mm : 4.30...4.50

CONSTANT REGULATION

Speed rpm : 250...380

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 1000

Rack travel mm : 11.90...12.00

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.80...10.20

2nd pressure hPa : 210

Rack travel in m: 10.00...10.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 700

Del.quantity cm3/ : 127.0...129.0

1000 s: (124.0...132.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.90

Speed rpm : 1160...1170

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 160.0...190.0

1000 s: (156.0...194.0)

Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 300

Rack travel in mm : 4.30...4.50

Remarks:

:

Delivery-valve spring pre-tension =

2.40...2.60 mm.

Permissible alteration from 2.20...2.90  
mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
 Edition : 30.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 846 969  
 Injection pump  
 Pump designation : PE6P110A320RS3312  
 EP type number : 0 411 816 788  
 Governor  
 Governor design. : RQ300/1000PA1012-1  
 Governor no. : 0 421 801 648

Customer-spec. information  
 Customer : DAF

Engine : LT 160 L

1st version kW : 160.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 14.00...15.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.50...5.70  
 & maximum rack tra: 13.9...14.9  
 Difference ° CS : 4.00...6.00

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 17.3...17.5

100 s: (17.0...17.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 1.6...2.1

100 s: (1.4...2.4)

Spread cm3 : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 173.0...175.0

1000 : (170.5...177.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.40  
Speed rpm : 1045...1060  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:

Speed rpm : 200  
Minimum rack travel: 9.90  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 15.10...15.20  
2nd speed rpm : 1000  
Rack travel in m: 15.00...15.20

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 14.40...14.50

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 12.30...12.50  
2nd pressure hPa : 530  
Rack travel in m: 13.90...14.00  
3rd pressure hPa : 380  
Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm3/ : 131.0...133.0  
1000 s: (128.5...135.5)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1045...1060

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 330.0...370.0  
1000 s: (327.0...373.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 16.5...21.5  
1000 s: (14.0...24.0)  
Spread cm3 : 4.50  
1000 s: (7.50)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 18,3 n 2  
 Edition : 23.10.92  
 Replaces : 04.91  
 Test oil : ISO-4113  
 Combination no. : 0 401 849 753  
 Injection pump  
 Pump designation : PE10P110A320LS3844  
 EP type number : 0 411 819 710  
 Governor  
 Governor design. : RQ300/1050PA187-32  
 Governor no. : 0 421 801 554

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM 443

1st version kW : 243.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 130...150

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 10- 9- 4- 1- 8- 7-  
 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 750

Rack travel in mm : 11.60...11.70

Del.quantity cm3/ : 10.2...10.4

100 s: (9.9...10.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0  
 Rack travel in mm : 8.3...8.6  
 Del.quantity cm3/ : 1.5...2.1  
 100 s: (1.2...2.3)  
 Spread cm3 : 0.4  
 100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 600  
 Rack travel in mm : 13.60...14.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 750  
 Del.quantity : 102.0...104.0  
 1000 : (99.5...106.5)  
 Spread cm3 : 4.00  
 1000 : (7.50)

## RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 13.7

Testing:  
 1st rack travel in: 10.60

Speed rpm : 1095...1110  
2nd rack travel in: 4.00  
Speed rpm : 1150...1180  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.9

#### Testing:

Speed rpm : 200

Minimum rack trave: 8.50

Speed rpm : 300

Rack travel in mm : 6.80...7.00

Rack travel in mm : 2.00

Speed rpm : 400...440

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 118.0...122.0

1000 s: (115.0...125.0)

Spread cm<sup>3</sup> : 6.00

1000 s: (9.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.60

Speed rpm : 1095...1110

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 140.0...160.0

1000 s: (136.0...164.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : STE 10,0 b2  
 Edition : 25.09.92  
 Replaces : 12.88  
 Test oil : ISO-4113  
 Combination no. : 0 401 856 158  
 Injection pump  
 Pump designation : PE6P110A721RS369  
 EP type number : 0 411 816 121  
 Governor  
 Governor design. : RQV250...1500PA413-4  
 Governor no. : 0 421 813 732

Customer-spec. information  
 Customer : HAEP

Engine : WD615.61/71

1st version kW : 191.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 14.5...14.7

100 s: (14.2...15.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 8.5...9.1

Del.quantity cm3/ : 1.8...2.4

100 s: (1.5...2.6)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.50...0.90

2nd speed rpm : 500

travel mm : 2.40...3.00

3rd speed rpm : 800

travel mm : 4.40...5.00

4th speed rpm : 1340

travel mm : 8.60...8.80

5th speed rpm : 1450

travel mm : 10.00...10.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1390

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 145.0...147.0

1000 : (142.0...150.0)

Spread cm3 : 4.00  
1000 : (7.50)

#### RATED SPEED

1st version  
Control lever  
position degrees: 100...108

#### Testing:

1st rack travel in: 12.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 68...76

#### Testing:

Speed rpm : 100  
Minimum rack travel: 10.20  
Speed rpm : 250  
Rack travel in mm : 8.70...8.90

#### CONSTANT REGULATION

Speed rpm : 300...450

Aneroid/Altitude  
Compensator Test

#### 1st version

#### Setting

Speed rpm : 700  
Pressure hPa : 700  
Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 700

1st pressure hPa : -  
Rack travel in m: 12.00...12.20  
2nd pressure hPa : 390  
Rack travel in m: 13.50...13.60  
3rd pressure hPa : 320  
Rack travel in m: 12.90...13.10

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 700

Del. quantity cm3/ : 133.0...137.0  
1000 s: (130.0...140.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del. quantity cm3/ : 101.0...103.0  
1000 s: (98.0...106.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 135.0...155.0  
1000 s: (131.0...159.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : HAE  
Edition : 23.10.92  
Replaces : 10.92  
Test oil : ISO-4113  
  
Combination no. : 0 401 856 159  
  
Injection pump  
Pump designation : PE6P110A721RS369  
EP type number : 0 411 816 121  
Governor  
Governor design. : RQ300/1300PA412-6  
Governor no. : 0 421 801 638

Customer-spec. information  
Customer : HAEP

Engine : WD615.60

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x wall thickness  
x length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
: (2.75...2.95)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.10...14.20

Del.quantity cm<sup>3</sup>/ : 14.6...14.8

100 s: (14.3...15.0)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 8.8...9.2

Del.quantity cm<sup>3</sup>/ : 1.8...2.4

100 s: (1.5...2.6)

Spread cm<sup>3</sup> : 0.4

100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.80...17.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 146.0...148.0

1000 : (143.5...150.5)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.4

### Testing:

1st rack travel in: 13.10

Speed rpm : 1345...1360

2nd rack travel in: 4.00

Speed rpm : 1425...1455

4th rack travel in: 1550

Speed rpm : 0.00...1.40

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100

Minimum rack travel: 7.40

Speed rpm : 300

Rack travel in mm : 5.90...6.10

Rack travel in mm : 2.00

Speed rpm : 400...440

#### TORQUE CONTROL

Dimension a mm : 0.40

Torque control curve - 1st version

1st speed rpm : 1300

Rack travel in m: 14.10...14.20

2nd speed rpm : 700

Rack travel in m: 14.60...15.00

3rd speed rpm : 900

Rack travel in m: 14.50...14.70

4th speed rpm : 1100

Rack travel in m: 14.30...14.50

#### Aneroid/Altitude

##### Compensator Test

#### 1st version

##### Setting

Speed rpm : 700

Pressure hPa : 700

Rack travel mm : 14.30...14.50

##### Measurement

Speed 1/min : 700

1st pressure hPa : -

Rack travel in m: 12.40...12.60

2nd pressure hPa : 390

Rack travel in m: 14.10...14.20

3rd pressure hPa : 300

Rack travel in m: 12.70...12.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 135.0...139.0

1000 s: (132.0...142.0)

Aneroid pressure h: -

Speed rpm : 700

Del.quantity cm<sup>3</sup>/ : 101.0...103.0

1000 s: (98.5...105.5)

#### BREAKAWAY

A16

#### 1st version

1mm rack travel less than

full load rack tr: 13.10

Speed rpm : 1345...1360

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 135.0...155.0

1000 s: (131.0...159.0)

Rack travel in mm : 16.50...17.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 6,1 q 1  
 Edition : 23.10.92  
 Replaces : 07.92  
 Test oil : ISO-4113

Combination no. : 0 401 876 340

Injection pump  
 Pump designation : PE6P110A32ORS499  
 EP type number : 0 411 816 169  
 Governor  
 Governor design. : RSV325...1400POA374-9  
 Governor no. : 0 421 833 335

Customer-spec. information  
 Customer : PENTA

Engine : TAMD61

1st version kW : 221.0  
 Rated speed : 2800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.40...2.50  
 : (2.35...2.55)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 11.10...11.20

---

Del.quantity cm<sup>3</sup>/ : 11.9...12.1

---

100 s: (11.6...12.4)

---

Spread cm<sup>3</sup> : 0.4

---

100 s: (0.7)

---

2nd speed rpm : 325.0

Rack travel in mm : 4.1...4.3

Del.quantity cm<sup>3</sup>/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
 Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000

Aneroid pressure h: 900

Del.quantity : 119.0...121.0

1000 : (116.0...124.0)

Spread cm<sup>3</sup> : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 114...122

Testing:  
 1st rack travel in: 10.10  
 Speed rpm : 1450...1460

2nd rack travel in: 4.00  
Speed rpm : 1525...1555  
4th rack travel in: 1630  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 79...87  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 3.7  
Speed rpm : 325  
Rack travel in mm : 4.10...4.30  
Rack travel in mm : 2.00  
Speed rpm : 450...510

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.00...11.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.90...9.10  
2nd pressure hPa : 370  
Rack travel in m: 9.10...9.20  
3rd pressure hPa : 720  
Rack travel in m: 10.60...10.80

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 1400  
Del.quantity cm3/ : 121.0...125.0  
1000 s: (118.0...128.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.0...63.0  
1000 s: (58.0...66.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1450...1460

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.10...4.30  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm3 : 3.00  
1000 s: (6.00)

Remarks:

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 23.10.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 401 876 788  
 Injection pump  
 Pump designation : PE6P110A320LS3835-3  
 EP type number : 0 411 816 773  
 Governor  
 Governor design. : RSV350...1050POA556  
 -1  
 Governor no. : 0 421 833 392  
 Customer-spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM 441  
 1st version kW : 165.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 0 681 343 009  
 Opening  
 pressure, bar : 172...175  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600  
 (A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.00...4.10  
 : (3.95...4.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050  
 Rack travel in mm : 12.70...12.80  
 Del.quantity cm3/ : 13.6...13.8  
 100 s: (13.3...14.0)  
 Spread cm3 : 0.4  
 100 s: (0.8)  
 2nd speed rpm : 350.0  
 Rack travel in mm : 8.3...8.9  
 Del.quantity cm3/ : 1.2...1.8  
 100 s: (0.9...2.0)  
 Spread cm3 : 0.4  
 100 s: (0.7)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 136.0...138.0  
 1000 : (133.5...140.5)  
 Spread cm3 : 4.00  
 1000 : (8.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 88...96

Testing:  
 1st rack travel in: 11.70  
 Speed rpm : 1070...1080  
 2nd rack travel in: 4.00

Speed rpm : 1115...1133  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

## APPLICATION

Excavator

### LOW IDLE 1

Control lever

position degrees: 64...72

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 8.6

### Testing:

Speed rpm : 100

Minimum rack travel: 19.50

Speed rpm : 350

Rack travel in mm : 8.30...8.90

Rack travel in mm : 2.00

Speed rpm : 380...440

### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 750

Del.quantity cm<sup>3</sup>/ : 124.0...128.0  
1000 s: (121.0...131.0)

Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.70

Speed rpm : 1070...1080

### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

Remarks:

:

Set 14.1...14.3 mm control-rod travel  
at lower full-load stop with

n = 1030 1/min.

Make full-load setting at upper full-  
load stop in accordance with test  
specifications.

Observe VDT-I-420/120

A20

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 8,8 d 5  
 Edition : 23.10.92  
 Replaces : 05.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 328  
 Injection pump  
 Pump designation : PES6P120A320RS419-2  
 EP type number : 0 412 026 048  
 Governor  
 Governor design. : RQ275/950PA753-1  
 Governor no. : 0 421 801 377

Customer spec. information  
 Customer : RVI

Engine : MIDS/PS062045 FC

1st version kW : 144.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.80...2.90  
 : (2.75...2.95)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 500

Rack travel in mm : 8.70...8.80

Del.quantity cm3/ : 12.0...12.2

100 s: (11.7...12.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.3...5.2

Del.quantity cm3/ : 1.7...2.3

100 s: (1.4...2.6)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 525

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 500

Aneroid pressure h: 700

Del.quantity : 120.0...122.0

1000 : (117.0...125.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 525

Rack travel in mm : 20.0

Testing:

1st rack travel in: 7.20

Speed rpm : 1015...1030

2nd rack travel in: 4.00

Speed rpm : 1050...1080  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 250

Rack travel in mm : 4.4

#### Testing:

Speed rpm : 150

Minimum rack travel: 5.80

Speed rpm : 250

Rack travel in mm : 4.20...4.40

Rack travel in mm : 2.00

Speed rpm : 330...370

#### TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 500

Rack travel in m: 8.70...8.80

2nd speed rpm : 950

Rack travel in m: 8.00...8.20

3rd speed rpm : 750

Rack travel in m: 8.30...8.50

#### Aneroid/Altitude

Compensator Test

#### 1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 8.70...8.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 8.00...8.20

2nd pressure hPa : 240

Rack travel in m: 8.45...8.55

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 950

Del.quantity cm3/ : 140.0...144.0  
1000 s: (137.0...147.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 107.0...109.0  
1000 s: (104.0...112.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 7.20

Speed rpm : 1015...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 140.0...160.0

1000 s: (136.0...164.0)

#### LOW IDLE

Speed rpm : 250

Rack travel in mm : 4.80...5.20

Del.quantity cm3/ : 17.0...23.0

1000 s: (14.0...26.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

:

Start-of-delivery mark 9.5° cam angle  
after start of delivery cyl. 1

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI 8,1 a  
 Edition : 23.10.92  
 Replaces : 09.91  
 Test oil : ISO-4113

Combination no. : 0 402 046 349

Injection pump  
 Pump designation : PES6P110A720RS530  
 EP type number : 0 412 016 075  
 Governor  
 Governor design. : RQV300...1000PA1016-5  
 Governor no. : 0 421 813 970

Customer-spec. information  
 Customer : IVECO-UNIC

Engine : 8365.25.540

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 2.00...2.10  
 : (1.95...2.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

---

Rack travel in mm : 10.00...10.10

---

Del.quantity cm3/ : 11.0...11.2

---

100 s: (10.7...11.4)

---

Spread cm3 : 0.4

---

100 s: (0.7)

---

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.8

Del.quantity cm3/ : 1.8...2.3

100 s: (1.5...2.5)

Spread cm3 : 0.4

100 s: (0.7)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1075  
 travel mm : 8.20...8.40

2nd speed rpm : 300  
 travel mm : 1.00...1.40

3rd speed rpm : 450  
 travel mm : 3.30...3.90

4th speed rpm : 700  
 travel mm : 5.30...5.70

5th speed rpm : 1400  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1210

Rack travel in mm : 8.30...10.90

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 700

Del.quantity : 110.0...112.0

1000 : (107.5...114.5)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 117...125

Testing:

1st rack travel in: 9.00

Speed rpm : 1070...1080

2nd rack travel in: 4.00

Speed rpm : 1140...1170

4th rack travel in: 1300

Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever

position degrees: 66...74

Testing:

Speed rpm : 200

Minimum rack travel: 9.00

Speed rpm : 300

Rack travel in mm : 6.50...6.70

CONSTANT REGULATION

Speed rpm : 310...430

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : 700

Rack travel mm : 10.00...10.10

Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.30...9.50

2nd pressure hPa : 300

Rack travel in m: 9.80...9.90

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 110.0...114.0

1000 s: (107.0...117.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 93.0...95.0

1000 s: (90.5...97.5)

## BREAKAWAY

A24

1st version

1mm rack travel less than

full load rack tr: 9.00

Speed rpm : 1070...1080

## STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 180.0...210.0

1000 s: (176.0...214.0)

LOW IDLE

Speed rpm : 300

Rack travel in mm : 6.40...6.80

Del.quantity cm<sup>3</sup>/ : 18.0...23.0

1000 s: (15.5...25.5)

Spread cm<sup>3</sup> : 4.50

1000 s: (7.50)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 9,8 f 1  
 Edition : 23.10.92  
 Replaces : 12.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 046 789  
 Injection pump  
 Pump designation : PES6P120A32ORS3139  
 EP type number : 0 412 026 718  
 Governor  
 Governor design. : RQV275...1000PA728-3  
 Governor no. : 0 421 813 657

Customer-spec. information  
 Customer : RVI

Engine : MIDR 062045 H

1st version kW : 227.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Grifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.5...5.7  
 Del.quantity cm3/ : 2.2...2.6  
 100 s: (1.9...2.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250  
 travel mm : 0.90...1.10  
 2nd speed rpm : 450  
 travel mm : 3.30...3.70  
 3rd speed rpm : 800  
 travel mm : 5.60...6.00  
 4th speed rpm : 1000  
 travel mm : 7.00...7.20

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1170  
 Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1000  
 Aneroid pressure h: 1000  
 Del.quantity : 193.0...195.0  
 1000 : (190.0...198.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 10.10  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 275  
Rack travel in mm : 5.50...5.70

CONSTANT REGULATION  
Speed rpm : 310...415

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.10...11.20

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 280  
Rack travel in m: 10.40...10.50  
3rd pressure hPa : 160  
Rack travel in m: 9.40...9.60

## START CUT-OUT

Speed 1/min : 195 (215)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 191.0...197.0  
1000 s: (188.0...200.0)

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 101.0...103.0  
1000 s: (98.0...106.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.10  
Speed rpm : 1065...1075

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 140.0...160.0  
1000 s: (136.0...164.0)

## LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.50...5.70  
Del.quantity cm<sup>3</sup>/ : 22.0...26.0  
1000 s: (19.0...29.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 9,8 f  
Edition : 23.10.92  
Replaces : 06.90  
Test oil : ISO-4113

Combination no. : 0 402 046 798

Injection pump  
Pump designation : PES6P120A320RS3139  
EP type number : 0 412 026 718  
Governor  
Governor design. : RQ275/105CPA893  
Governor no. : 0 421 801 442

Customer-spec. information  
Customer : RVI

Engine : MIDR 062045 M

1st version kW : 236.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 11.90...12.00

Del.quantity cm3/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.4...5.8

Del.quantity cm3/ : 2.6...3.0

100 s: (2.3...3.3)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.90

Speed rpm : 1105...1120

2nd rack travel in: 4.00

Speed rpm : 1200...1230  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 6.3

#### Testing:

Speed rpm : 175  
Minimum rack travel: 7.10  
Speed rpm : 275  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 340...380

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 12.30...12.50  
2nd speed rpm : 1050  
Rack travel in m: 12.20...12.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.90...12.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.70...9.10  
2nd pressure hPa : 360  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 160  
Rack travel in m: 9.50...9.90

#### START CUT-OUT

Speed 1/min : 195 (215)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm3/ : 220.0...226.0  
1000 s: (217.0...229.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 107.0...109.0  
1000 s: (104.0...112.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1105...1120

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.40...5.80  
Del.quantity cm3/ : 26.0...30.0  
1000 s: (23.0...33.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

#### Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER  
Edition : 23.10.92  
Replaces : 09.92  
Test oil : ISC-4113  
  
Combination no. : 0 402 046 840  
  
Injection pump  
Pump designation : PES6P120A320RS3307  
EP type number : 0 412 026 757  
Governor  
Governor design. : RQV250...950PA794-3  
Governor no. : 0 421 814 015

Customer-spec. information  
Customer : PERKINS

Engine : EAGLE TX 300/335

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. l/h: 115...135

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 12.00...13.00  
Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 22.3...22.5

100 s: (22.0...22.8)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.3...1.7

100 s: (1.0...2.0)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.40

2nd speed rpm : 350

travel mm : 2.00...2.50

3rd speed rpm : 660

travel mm : 3.70...4.20

4th speed rpm : 985

travel mm : 7.40...7.60

5th speed rpm : 1260

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1110

Rack travel in mm : 10.00...12.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 223.0...225.0  
1000 : (220.0...228.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.30  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 5.90...6.10

CONSTANT REGULATION  
Speed rpm : 250...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 340  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 220  
Rack travel in m: 10.40...10.60

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version

B02

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 160.0...200.0  
1000 s: (156.0...204.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.90...6.10

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : IHC  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 046 841  
  
Injection pump  
Pump designation : PES6P100A32DLS3309  
EP type number : 0 412 006 704  
Governor  
Governor design. : RQV350...1300PA1042-4K  
Governor no. : 0 421 815 328

Customer-spec. information  
Customer : NAVISTAR

Engine : DTA-408

1st version kW : 171.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 2 417 413 038

Inlet press., bar : 2.80

Overflow  
quantity min. 1/h: 240...260

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.95...3.05  
: (2.90...3.10)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900  
  
Rack travel in mm : 12.60...12.70  
  
Del.quantity cm3/ : 14.7...14.9  
100 s: (14.5...15.1)

Spread cm3 : 0.8  
100 s: (1.2)

2nd speed rpm : 350.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 1.3...1.7  
100 s: (1.0...1.9)  
Spread cm3 : 0.4  
100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.60...2.00  
2nd speed rpm : 500  
travel mm : 3.80...4.20  
3rd speed rpm : 800  
travel mm : 5.80...6.20  
4th speed rpm : 1300  
travel mm : 8.90...9.10  
5th speed rpm : 1500  
travel mm : 10.40...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 147.5...149.5  
1000 : (145.5...151.5)

Spread      cm<sup>3</sup> : 8.00  
            1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 11.90  
Speed      rpm : 1340...1370  
2nd rack travel in: 4.00  
Speed      rpm : 1500...1510  
4th rack travel in: 1650  
Speed      rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 16...24

Testing:  
Speed      rpm : 275  
Minimum rack travel: 6.00  
Speed      rpm : 350  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION  
Speed      rpm : 350...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in mm: 12.60...12.70  
2nd speed rpm : 1300  
Rack travel in mm: 12.90...13.10  
3rd speed rpm : 700  
Rack travel in mm: 11.60...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed      rpm : 1300  
Pressure    hPa : 1200  
Rack travel mm : 12.90...13.10

Measurement  
Speed      1/min : 1300

1st pressure hPa : -  
Rack travel in mm: 9.50...9.90  
2nd pressure hPa : 300  
Rack travel in mm: 10.60...10.70  
3rd pressure hPa : 670  
Rack travel in mm: 12.00...12.40

#### START CUT-OUT

Speed      1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed      rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 140.5...144.5  
            1000 s: (138.5...146.5)  
Spread      cm<sup>3</sup> : 8.00  
            1000 s: (12.0)  
Aneroid pressure h: -  
Speed      rpm : 1300  
Del.quantity cm<sup>3</sup>/ : 85.5...89.5  
            1000 s: (83.5...91.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.90  
Speed      rpm : 1340...1370

#### STARTING FUEL DELIVERY

Speed      rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...160.0  
            1000 s: (115.0...165.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed      rpm : 350  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 13.0...17.0  
            1000 s: (10.5...19.5)  
Spread      cm<sup>3</sup> : 4.00  
            1000 s: (6.50)

Remarks: : NAVISTAR #1819917C91

Limit shutoff stop screw to 1.0 mm.

Bow dimension:  
Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DEE  
Edition : 23.10.92  
Replaces : 09.92  
Test oil : ISO-4113

Combination no. : 0 402 076 745

Injection pump  
Pump designation : PES6P120A720RS3203  
EP type number : 0 412 026 728  
Governor  
Governor design. : RSV625...1100P2A534-9  
Governor no. : 0 421 833 372

Customer-spec. information  
Customer : JOHN DEERE

Engine : 6076 HZ 031

1st version kW : 205.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,5

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness : 6.00X3.00X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 27...29

Prestroke mm : 3.55...3.65  
: (3.50...3.70)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 12.80...12.90  
Del.quantity cm3/ : 17.6...17.8  
100 s: (17.4...18.0)  
Spread cm3 : 0.4  
100 s: (0.6)

2nd speed rpm : 625.0  
Rack travel in mm : 5.4...5.6  
Del.quantity cm3/ : 2.7...3.1  
100 s: (2.5...3.3)  
Spread cm3 : 0.6  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : 4.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200  
Del.quantity : 176.5...178.5  
1000 : (174.5...180.5)  
Spread cm3 : 4.00  
1000 : (6.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 42...50

Testing:

1st rack travel in: 11.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1205...1215  
3rd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 22...30  
Setting point w/out bumper spring  
Speed rpm : 625  
Rack travel in mm : 5.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 625  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 700  
Rack travel in m: 13.40...13.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 645  
Rack travel in m: 12.10...12.20  
3rd pressure hPa : 840  
Rack travel in m: 12.90...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 189.0...193.0  
1000 s: (187.0...195.0)  
Aneroid pressure h: -  
Speed rpm : 800

Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (141.0...149.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1140...1150

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...110.0  
1000 s: (85.0...115.0)  
Rack travel in mm : 20.00...21.00

LOW IDLE

Speed rpm : 625  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 27.0...31.0  
1000 s: (25.0...33.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (8.00)

Remarks:

: JOHN DEERE # RE47399

Adjustment without torque-control  
spring retainer with 0,5 mm less  
control-rod travel. Increase in  
full-load delivery with torque-control  
spring retainer.

Starting/full-load transition speed  
from holding magnet = 450 1/min.

Start-of-delivery mark at 10° cam  
rotation angle after start of delivery,  
cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 607  
  
Injection pump  
Pump designation : PE6P130A720RS7270  
EP type number : 0 412 636 821  
Governor  
Governor design. : RQV300...950PA946-4  
Governor no. : 0 421 814 026

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8210.42P.032

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 13.50...14.50

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 950

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 21.1...21.3

100 s: (20.8...21.6)

Spread cm3 : 0.5

100 s: (0.8)

2nd speed rpm : 275.0

Rack travel in mm : 4.2...4.6

Del.quantity cm3/ : 1.9...2.5

100 s: (1.6...2.8)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 995

travel mm : 8.40...8.60

2nd speed rpm : 300

travel mm : 1.10...1.30

3rd speed rpm : 450

travel mm : 2.80...3.40

4th speed rpm : 650

travel mm : 4.40...5.00

5th speed rpm : 1200

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1060

Rack travel in mm : 9.00...11.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 950

Aneroid pressure h: 1000

Del.quantity : 211.0...213.0

1000 : (208.0...216.0)

Spread cm3 : 5.00  
1000 : (8.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 10.30  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1045...1075  
3rd rack travel in: 4.00  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 73...81

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.60  
Speed rpm : 300  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 320...440

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 11.30...11.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.40  
2nd pressure hPa : 300  
Rack travel in m: 11.00...11.10  
3rd pressure hPa : 260  
Rack travel in m: 10.50...10.70

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 550  
Del.quantity cm3/ : 215.0...221.0  
1000 s: (212.0...224.0)  
Aneroid pressure h: -

Speed rpm : 550  
Del.quantity cm3/ : 184.0...186.0  
1000 s: (181.0...189.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.30  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 135.0...165.0  
1000 s: (131.0...169.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.20...4.60  
Del.quantity cm3/ : 19.0...25.0  
1000 s: (16.0...28.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 30.10.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 793  
  
Injection pump  
Pump designation : PE6P120A320LS7846  
EP type number : 0 412 626 865  
Governor  
Governor design. : RQ300/1050PA1030-8  
Governor no. : 0 421 801 673

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 213.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 800

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.40

Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.20

##### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 450  
Rack travel in m: 11.60...11.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 800  
Speed rpm : 550  
Del.quantity cm3/ : 199.0...203.0  
1000 s: (196.0...206.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 794  
Injection pump  
Pump designation : PE6P120A320LS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQV300...1050PA1033-9  
Governor no. : 0 421 814 028

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X1.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
(5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050  
Rack travel in mm : 11.70...11.80  
Del. quantity cm3/ : 18.9...19.1  
100 s: (18.6...19.4)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.3...5.9  
Del. quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.50...1.00  
2nd speed rpm : 575  
travel mm : 4.30...4.80  
3rd speed rpm : 625  
travel mm : 4.80...5.30  
4th speed rpm : 830  
travel mm : 5.90...6.40  
5th speed rpm : 1109  
travel mm : 8.20...8.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1160  
Rack travel in mm : 9.40...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050

Aneroid pressure h: 800  
Del.quantity : 189.0...191.0  
1000 : (186.0...194.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 10.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 77...85

Testing:  
Speed rpm : 200  
Minimum rack trave: 8.50  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 380...420

CONSTANT REGULATION  
Speed rpm : 300...400

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...10.00

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.10...10.20  
2nd pressure hPa : 350  
Rack travel in m: 10.80...11.00

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 800  
Speed rpm : 550  
Del.quantity cm3/ : 181.0...185.0  
1000 s: (178.0...188.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.70  
Speed rpm : 1090...1100

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 21.09.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 795  
  
Injection pump  
Pump designation : PE6P120A320LS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQ300/1050PA1030-4  
Governor no. : 0 421 801 664

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.3...5.9

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.10  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.6

Testing:

Speed rpm : 200  
Minimum rack travel: 7.40  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.30

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.10...10.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 550  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 50.0...80.0  
1000 s: (46.0...84.0)  
Rack travel in mm : 10.00...10.30

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 795  
Injection pump  
Pump designation : PE6P120A320LS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQV300...1050PA1033-8  
Governor no. : 0 421 814 027  
Customer-spec. information  
Customer : MERCEDES-BENZ  
Engine : OM401 LA  
1st version kW : 180.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 105  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test lines : 1 680 750 075  
Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050  
Rack travel in mm : 11.10...11.20  
Del.quantity cm3/ : 17.0...17.2  
100 s: (16.7...17.5)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.3...5.9  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.50...1.00  
2nd speed rpm : 575  
travel mm : 4.30...4.80  
3rd speed rpm : 625  
travel mm : 4.80...5.30  
4th speed rpm : 830  
travel mm : 5.90...6.40  
5th speed rpm : 1109  
travel mm : 8.20...8.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1170  
Rack travel in mm : 8.80...11.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050

Aneroid pressure h: 700  
Del.quantity : 170.0...172.0  
1000 : (167.0...175.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

#### Testing:

1st rack travel in: 10.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

#### LOW IDLE 1

Control lever  
position degrees: 77...85

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.50  
Speed rpm : 300  
Rack travel in mm : 5.50...5.70  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### CONSTANT REGULATION

Speed rpm : 300...400

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.20...10.30

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700

Speed rpm : 550  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 50.0...80.0  
1000 s: (46.0...84.0)  
Rack travel in mm : 10.00...10.30

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 09.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 796  
  
Injection pump  
Pump designation : PE6P120A32OLS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQ300/1050PA1030-5  
Governor no. : 0 421 801 665

Customer-spec. information  
Customer : MBERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050  
  
Rack travel in mm : 11.70...11.80  
  
Del.quantity cm3/ : 18.9...19.1  
100 s: (18.6...19.4)  
  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 4.9...5.5  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 800  
Del.quantity : 189.0...191.0  
1000 : (186.0...194.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.70  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...10.00

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 350  
Rack travel in m: 10.70...10.90

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 550  
Del.quantity cm3/ : 182.0...186.0  
1000 s: (179.0...189.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 45.0...65.0  
1000 s: (41.0...69.0)  
Rack travel in mm : 9.60...10.00

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 05.10.92  
Replaces : 08.92  
Test oil : ISO-4113

Combination no. : 0 402 646 799

Injection pump  
Pump designation : PE6P120A320LS7852  
EP type number : 0 412 626 871  
Governor  
Governor design. : RQ300/950PA1031-5  
Governor no. : 0 421 801 657

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 14.00...14.10  
Del.quantity cm<sup>3</sup>/ : 23.4...23.6  
100 s: (23.1...23.9)  
Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.6...6.2  
Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1100  
Del.quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.00

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 13.00

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.9

Testing:

Speed rpm : 200

Minimum rack travel: 8.10

Speed rpm : 300

Rack travel in mm : 5.80...6.00

Rack travel in mm : 2.00

Speed rpm : 380...420

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : 300

Rack travel in m: 10.80...10.90

2nd pressure hPa : 700

Rack travel in m: 12.90...13.10

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1100

Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 228.0...232.0

1000 s: (225.0...235.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 990...1005

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h3  
Edition : 21.09.92  
Replaces : 01.91  
Test oil : ISO-4113

Combination no. : 0 402 746 887

Injection pump  
Pump designation : PES6P120A720RS7200  
EP type number : 0 412 726 833  
Governor  
Governor design. : RQV325...975PA944-2K  
Governor no. : 0 421 815 237

Customer-spec. information  
Customer : MACK TRUCKS

Engine : E7-300A

1st version kw : 224.0  
Rated speed : 1950  
2nd version kw : 224.0  
Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 975

---

Rack travel in mm : 13.00...13.10

---

Del.quantity cm3/ : 21.8...22.0  
100 s: (21.5...22.3)

---

Spread cm3 : 0.5  
100 s: (0.9)

---

2nd speed rpm : 340.0  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 3.1...3.7  
100 s: (2.9...3.9)

---

Spread cm3 : 0.8  
100 s: (1.2)

---

1st speed rpm : 975  
Rack travel in mm : 13.0...13.1  
Del.quantity cm3/ : 22.5...22.7  
100 s: (22.2...23.0)

---

Spread cm3 : 0.5  
100 s: (0.9)

---

2nd speed rpm : 340  
Rack travel in mm : 4.8...5.0  
Del.quantity cm3/ : 3.1...3.7  
100 s: (2.9...3.9)

---

Spread cm3 : 0.8  
100 s: (1.2)

---

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60  
2nd speed rpm : 450  
travel mm : 2.80...3.20  
3rd speed rpm : 950  
travel mm : 7.90...8.10

4th speed rpm : 1200  
travel mm : 10.20...10.60

GUIDE SLEEVE POSITION  
Control-lever position  
Degree: -1

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del.quantity : 218.5...220.5  
1000 : (215.5...223.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

2nd version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del.quantity cm<sup>3</sup>/ : 225.0...227.0  
1000 s: (222.0...230.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 57...65

Testing:

1st rack travel in: 12.00  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
3rd rack travel in: 4.00  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

2nd version

Control lever  
position degrees: 57...65

Testing:

1st rack travel in: 12.00  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 8...16

Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.80...5.00

CONSTANT REGULATION

Speed rpm : 325...520

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 975  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 600  
Rack travel in m: 12.20...12.40  
3rd speed rpm : 500  
Rack travel in m: 11.20...11.60

Torque control curve - 2nd version

1st speed rpm : 975  
Rack travel in m: 13.0...13.1  
2nd speed rpm : 600  
Rack travel in m: 12.2...12.4  
3rd speed rpm : 500  
Rack travel in m: 11.2...11.6

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.10

Measurement

Speed 1/min : 975

1st pressure hPa : -

Rack travel in m: 8.00...8.40

2nd pressure hPa : 325

Rack travel in m: 9.40...9.50

3rd pressure hPa : 640

Rack travel in m: 11.70...12.10

2th version

Setting

Speed rpm : 975  
Pressure hPa : 1200  
Rack travel in mm : 13.0...13.1

Measurement

Speed rpm : 975

1st pressure hPa : -

Rack travel in m: 8.00...8.40

2nd pressure hPa : 325

Rack travel in m: 9.40...9.50

3rd pressure hPa : 640

Rack travel in m: 11.7...12.1

START CUT-OUT

Speed 1/min : 250 (255)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 238.5...244.5  
1000 s: (235.5...247.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 149.0...153.0  
1000 s: (147.0...155.0)

### 2nd version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 240.5...246.5  
1000 s: (237.5...249.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 149.0...153.0  
1000 s: (147.0...155.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1015...1045

### 2nd version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1015...1045

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.0...21.0

## LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.80...5.00  
Del.quantity cm<sup>3</sup>/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

### Remarks:

: MACK # 313GC5188-P8

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

### Bow dimension:

Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h  
Edition : 21.09.92  
Replaces : 12.90  
Test oil : ISO-4113

Combination no. : 0 402 746 890

Injection pump  
Pump designation : PES6P120A720RS7200  
EP type number : 0 412 723 833  
Governor  
Governor design. : RQV325...875PA944-5K  
Governor no. : 0 421 815 240

Customer-spec. information  
Customer : MACK TRUCKS

Engine : EM7-275

1st version kW : 202.0  
Rated speed : 1750  
2nd version kW : 202.0  
Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
(3.20...3.40)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

---

Rack travel in mm : 13.20...13.30

---

Del.quantity cm3/ : 23.4...23.6

---

100 s: (23.1...23.9)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 340.0  
Rack travel in mm : 4.6...4.8  
Del.quantity cm3/ : 3.1...3.7  
100 s: (2.9...3.9)  
Spread cm3 : 0.8  
100 s: (1.2)

1st speed rpm : 875  
Rack travel in mm : 13.2...13.3  
Del.quantity cm3/ : 23.5...23.7  
100 s: (23.2...24.0)  
Spread cm3 : 0.5  
100 s: (0.9)  
2nd speed rpm : 340  
Rack travel in mm : 4.6...4.8  
Del.quantity cm3/ : 3.1...3.7  
100 s: (2.9...3.9)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.40...1.60  
2nd speed rpm : 450  
travel mm : 3.30...3.70  
3rd speed rpm : 700  
travel mm : 7.90...8.30

4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity cm<sup>3</sup>/ : 235.5...237.5  
1000 s: (232.5...240.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 60...68

##### Testing:

1st rack travel in: 12.20  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1065...1075  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 60...68

##### Testing:

1st rack travel in: 12.20  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1065...1075  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 510  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 600  
Rack travel in m: 13.80...14.00  
4th speed rpm : 450  
Rack travel in m: 12.90...13.30

Torque control curve - 2nd version

1st speed rpm : 875  
Rack travel in m: 13.2...13.3  
2nd speed rpm : 510  
Rack travel in m: 13.8...14.0  
3rd speed rpm : 600  
Rack travel in m: 13.8...14.0  
4th speed rpm : 450  
Rack travel in m: 12.9...13.3

Aneroid/Altitude  
Compensator Test

##### 1st version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.80...14.00

##### Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.40...8.80

2nd pressure hPa : 310

Rack travel in m: 10.10...10.20

3rd pressure hPa : 635

Rack travel in m: 12.60...13.00

##### 2th version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel in mm : 13.8...14.0

##### Measurement

Speed rpm : 510

1st pressure hPa : -

Rack travel in m: 8.40...8.80

2nd pressure hPa : 310

Rack travel in m: 10.1...10.2

3rd pressure hPa : 635

Rack travel in m: 12.6...13.0

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 311.0...317.0

1000 s: (308.0...320.0)

Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*

1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 155.5...159.5

1000 s: (153.5...161.5)

##### 2nd version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 311.0...317.0

1000 s: (308.0...320.0)

Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*

1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 155.5...159.5

1000 s: (153.5...161.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 915...945

##### 2nd version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 915...945

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.0

#### LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 31.0...37.0

1000 s: (29.0...39.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P4

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h4  
 Edition : 21.09.92  
 Replaces : 01.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 891  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 725 833  
 Governor  
 Governor design. : RQV325...875PA944-6K  
 Governor no. : 0 421 815 241

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-250

1st version kW : 187.0  
 Rated speed : 1750  
 2nd version kW : 187.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.50...12.60

Del.quantity cm<sup>3</sup>/ : 21.3...21.5

100 s: (21.0...21.8)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

1st speed rpm : 875

Rack travel in mm : 12.5...12.6

Del.quantity cm<sup>3</sup>/ : 21.5...21.7

100 s: (21.2...22.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm<sup>3</sup>/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30

4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 875  
Aneroid pressure h : 1200  
Del. quantity : 213.0...215.0  
1000 : (210.0...218.0)  
Spread cm3 : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 875  
Aneroid pressure h : 1200  
Del. quantity cm3/ : 215.0...217.0  
1000 s : (212.0...220.0)  
Spread cm3 : 5.00  
1000 s : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 62...70

##### Testing:

1st rack travel in: 11.50  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1045...1055  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 62...70

##### Testing:

1st rack travel in: 11.50  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1045...1055  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 510  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 600  
Rack travel in m: 13.40...13.60  
4th speed rpm : 450  
Rack travel in m: 12.60...13.00

Torque control curve - 2nd version

1st speed rpm : 875  
Rack travel in m: 12.5...12.6  
2nd speed rpm : 510  
Rack travel in m: 13.4...13.6  
3rd speed rpm : 600  
Rack travel in m: 13.4...13.6  
4th speed rpm : 450  
Rack travel in m: 12.6...13.0

Aneroid/Altitude

Compensator Test

##### 1st version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

##### Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 285

Rack travel in m: 10.00...10.10

3rd pressure hPa : 570

Rack travel in m: 12.30...12.70

##### 2th version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel in mm : 13.4...13.6

##### Measurement

Speed rpm : 510

1st pressure hPa : -

Rack travel in m: 8.50...8.90

2nd pressure hPa : 285

Rack travel in m: 10.0...10.1

3rd pressure hPa : 570

Rack travel in m: 12.3...12.7

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm<sup>3</sup>/ : 291.5...297.5  
1000 s: (288.5...300.5)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm<sup>3</sup>/ : 199.0...201.0  
1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm<sup>3</sup>/ : 153.0...157.0  
1000 s: (151.0...159.0)

##### 2nd version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm<sup>3</sup>/ : 291.5...297.5  
1000 s: (288.5...300.5)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm<sup>3</sup>/ : 153.0...157.0  
1000 s: (151.0...159.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.50

Speed rpm : 915...945

##### 2nd version

1mm rack travel less than

full load rack tr: 11.50

Speed rpm : 915...945

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)

Rack travel in mm : 19.0...21.0

#### LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm<sup>3</sup>/ : 31.0...37.0  
1000 s: (29.0...39.0)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313G05188-P2

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Box dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h5  
 Edition : 21.09.92  
 Replaces : 01.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 892  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...975PA944-7K  
 Governor no. : 0 421 815 242

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-250A

1st version kW : 180.0  
 Rated speed : 1950  
 2nd version kW : 180.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 20.2...20.4

100 s: (19.9...20.7)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.8...5.0

Del.quantity cm<sup>3</sup>/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

1st speed rpm : 975

Rack travel in mm : 12.3...12.4

Del.quantity cm<sup>3</sup>/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.80...5.00

Del.quantity cm<sup>3</sup>/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 950

travel mm : 7.90...8.10

4th speed rpm : 1200  
travel mm : 10.20...10.60

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del. quantity : 202.0...204.0  
1000 : (199.0...207.0)  
Spread cm3 : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del. quantity cm3/ : 205.5...207.5  
1000 s: (202.5...210.5)  
Spread cm3 : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control Lever  
position degrees: 57...65

##### Testing:

1st rack travel in: 11.30  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1175...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

##### 2nd version

Control Lever  
position degrees: 57...65

##### Testing:

1st rack travel in: 11.30  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1175...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control Lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

C03

Dimension a mm : ?

#### Torque control curve - 1st version

1st speed rpm : 975  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 800  
Rack travel in m: 12.30...12.50  
4th speed rpm : 500  
Rack travel in m: 11.40...11.80

#### Torque control curve - 2nd version

1st speed rpm : 975  
Rack travel in m: 12.3...12.4  
2nd speed rpm : 600  
Rack travel in m: 12.1...12.3  
3rd speed rpm : 800  
Rack travel in m: 12.3...12.5  
4th speed rpm : 500  
Rack travel in m: 11.4...11.8

#### Aneroid/Altitude Compensator Test

##### 1st version

##### Setting

Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.40

##### Measurement

Speed 1/min : 975

##### 1st pressure hPa : -

Rack travel in m: 8.50...8.90

##### 2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

##### 3rd pressure hPa : 570

Rack travel in m: 11.40...11.80

##### 2th version

##### Setting

Speed rpm : 975  
Pressure hPa : 1200  
Rack travel in mm : 12.3...12.4

##### Measurement

Speed rpm : 975

##### 1st pressure hPa : -

Rack travel in m: 8.50...8.90

##### 2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

##### 3rd pressure hPa : 570

Rack travel in m: 11.4...11.8

#### START CUT-OUT

Speed 1/min : 250 (255)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

### 2nd version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1015...1045

### 2nd version

1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1015...1045

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.0...21.0

## LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

### Remarks:

: MACK # 313GC5188-P6

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

### Bow dimension:

Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h2  
Edition : 21.09.92  
Replaces : 02.91  
Test oil : ISO-4113

Combination no. : 0 402 746 896

Injection pump  
Pump designation : PES6P120A720RS7200  
EP type number : 0 412 726 833  
Governor  
Governor design. : RQV325...900PA944-11  
K  
Governor no. : 0 421 815 260

Customer-spec. information  
Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0  
Rated speed : 1800  
2nd version kW : 261.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 27.1...27.3

100 s: (26.8...27.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

1st speed rpm : 900

Rack travel in mm : 14.5...14.6

Del.quantity cm3/ : 27.7...27.9

100 s: (27.4...28.2)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 700

travel mm : 6.00...6.40  
4th speed rpm : 900  
travel mm : 8.50...8.70  
5th speed rpm : 1050  
travel mm : 9.80...10.20

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del. quantity : 271.0...273.0  
1000 : (268.0...276.0)  
Spread cm3 : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 900  
Aneroid pressure h: 1200  
Del. quantity cm3/ : 277.5...279.5  
1000 s: (274.5...282.5)  
Spread cm3 : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 59...67

##### Testing:

1st rack travel in: 13.50  
Speed rpm : 940...990  
2nd rack travel in: 4.00  
Speed rpm : 1115...1125  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 59...67

##### Testing:

1st rack travel in: 13.50  
Speed rpm : 940...990  
2nd rack travel in: 4.00  
Speed rpm : 1115...1125  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

006

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 900  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 675  
Rack travel in m: 13.80...14.00  
4th speed rpm : 500  
Rack travel in m: 11.90...12.70

Torque control curve - 2nd version

1st speed rpm : 900  
Rack travel in m: 14.5...14.6  
2nd speed rpm : 625  
Rack travel in m: 13.8...14.0  
3rd speed rpm : 675  
Rack travel in m: 13.8...14.0  
4th speed rpm : 500  
Rack travel in m: 11.9...12.7

Aneroid/Altitude  
Compensator Test

##### 1st version

##### Setting

Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

##### Measurement

Speed 1/min : 900

1st pressure hPa : -

Rack travel in m: 7.90...8.30

2nd pressure hPa : 400

Rack travel in m: 9.80...9.90

3rd pressure hPa : 775

Rack travel in m: 12.60...13.00

##### 2th version

##### Setting

Speed rpm : 900  
Pressure hPa : 1200  
Rack travel in mm : 14.5...14.6

##### Measurement

Speed rpm : 900

1st pressure hPa : -

Rack travel in m: 8.10...8.50

2nd pressure hPa : 400

Rack travel in m: 9.80...9.90

3rd pressure hPa : 775

Rack travel in m: 12.6...13.0

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200

Speed rpm : 625

Del.quantity cm3/ : 290.0...296.0  
1000 s: (287.0...299.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 150.0...154.0  
1000 s: (148.0...156.0)

##### 2nd version

Aneroid pressure h: 1200

Speed rpm : 625

Del.quantity cm3/ : 290.0...296.0  
1000 s: (287.0...299.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (180.5...207.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 150.0...154.0  
1000 s: (148.0...156.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 940...990

##### 2nd version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 940...990

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)

Rack travel in mm : 19.0...21.0

#### LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 31.0...37.0  
1000 s: (29.0...39.0)

Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h1  
 Edition : 21.09.92  
 Replaces : 02.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 897  
 Injection pump  
 Pump designation : PES6P120A72ORS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...875PA944-12  
 K  
 Governor no. : 0 421 815 261

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-300

1st version kW : 224.0  
 Rated speed : 1750  
 2nd version kW : 224.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ' : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875  
 Rack travel in mm : 14.20...14.30  
 Del. quantity cm3/ : 25.3...25.5  
 100 s: (25.0...25.8)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 340.0  
 Rack travel in mm : 4.6...4.8  
 Del. quantity cm3/ : 3.1...3.7  
 100 s: (2.9...3.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

1st speed rpm : 875  
 Rack travel in mm : 14.0...14.1  
 Del. quantity cm3/ : 25.0...25.2  
 100 s: (24.7...25.5)  
 Spread cm3 : 0.5  
 100 s: (0.9)  
 2nd speed rpm : 340  
 Rack travel in mm : 4.6...4.8  
 Del. quantity cm3/ : 3.1...3.7  
 100 s: (2.9...3.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
 travel mm : 1.40...1.60  
 2nd speed rpm : 450  
 travel mm : 3.30...3.70  
 3rd speed rpm : 700

travel mm : 7.90...8.30  
4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del.quantity : 253.5...255.5  
1000 : (250.5...258.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del.quantity cm<sup>3</sup>/ : 250.0...255.0  
1000 s: (247.0...255.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 61...69

##### Testing:

1st rack travel in: 13.20  
Speed rpm : 915...965  
2nd rack travel in: 4.00  
Speed rpm : 1075...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 61...69

##### Testing:

1st rack travel in: 13.00  
Speed rpm : 915...965  
2nd rack travel in: 4.00  
Speed rpm : 1075...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

C09

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875  
Rack travel in m: 14.20...14.30  
2nd speed rpm : 510  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 575  
Rack travel in m: 14.80...15.00  
4th speed rpm : 450  
Rack travel in m: 13.90...14.30

Torque control curve - 2nd version

1st speed rpm : 875  
Rack travel in m: 14.0...14.1  
2nd speed rpm : 510  
Rack travel in m: 14.7...14.9  
3rd speed rpm : 575  
Rack travel in m: 14.7...14.9  
4th speed rpm : 450  
Rack travel in m: 13.9...14.3

#### Aneroid/Altitude Compensator Test

##### 1st version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.80...15.00

##### Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 370

Rack travel in m: 10.30...10.40

3rd pressure hPa : 760

Rack travel in m: 13.30...13.70

##### 2th version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel in mm : 14.7...14.9

##### Measurement

Speed rpm : 510

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 370

Rack travel in m: 10.3...10.4

3rd pressure hPa : 760

Rack travel in m: 13.3...13.7

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 334.0...340.0

1000 s: (331.0...343.0)

Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*

1000 s: (159.5...183.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 156.0...160.0

1000 s: (154.0...162.0)

##### 2nd version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 328.0...334.0

1000 s: (325.0...337.0)

Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*

1000 s: (159.5...183.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 156.0...160.0

1000 s: (154.0...162.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 915...965

##### 2nd version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 915...965

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 190.0...230.0

1000 s: (180.0...240.0)

Rack travel in mm : 19.0...21.0

#### LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 31.0...37.0

1000 s: (29.0...39.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P10

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# INJ.-PUMP TEST SPECIFICATIONS

nst. in remarks column

cheet : S0F  
n : 11.11.92  
es : 02.07.92  
ating oil : ISO-4113  
  
ion pump : VE4/11F2000R342  
umber : 0 460 414 067  
er Part-No. :

er-specific information  
er : S0FIM

: 8140.07.2700

## ENCH REQUIREMENTS

ating-oil  
temp. °C  
hermometer : 40.00...48.00  
onically : 42.00...50.00

press., bar : 0.30...0.40

ating nozzle-holder  
ly : 1 688 901 027

g  
re bar: 250.00...253.00

ated-plate  
er mm: 0.5

nj. tubing : 1 680 750 073

e diameter : 6.00  
thickness : 2.00  
th mm: 450

of delivery  
oke mm: 0.3  
(from BDC): (+0.02(0.04)

ion-pump setting values  
pecifications in parentheses

-device travel

1/min: 1100  
g value mm: 3.10...3.50  
f  
omagnet Volt: 12

Supply-pump pressure

Speed 1/min: 1100  
Setting value bar: 5.70...6.30  
Shutoff  
electromagnet Volt: 12

Full-load del. with charge press.:

Speed 1/min: 525  
Del. quantity cm3/  
1000S.: 27.00...28.00 F

Shutoff  
electromagnet Volt: 12

Full-load del. w/out charge press.:

Speed 1/min: 1100  
Del. quantity cm3/  
1000S.: 54.00...55.00 E

Shutoff  
electromagnet Volt: 12  
Dispersion cm3/: 3.5  
1000S.: (4.5)

Low-idle speed regulation

Speed 1/min: 350  
Del. quantity cm3/  
1000S.: 10.50...14.50

Shutoff  
electromagnet Volt: 12  
Del. quantity cm3/: 3.0  
1000S.: (3.5)

Full-load speed regulation

Speed 1/min: 2300  
Del. quantity cm3/  
1000S.: 18.00...22.00

Shutoff  
electromagnet Volt: 12

Start:

Speed 1/min: 100  
Del. quantity cm3/: 40.00...80.00  
mind 1000S.: 40.00

Shutoff  
electromagnet Volt: 12

Load-dependent start of delivery:  
Inj.-qty.dif.measurement:

Speed 1/min: 1100  
Charge press hPa: 12  
Inj.-qty. cm3/  
difference 1000S.: 13.30...15.30 #  
Shutoff  
electromagnet Volt: 12

SP press.-dif.measurement

pompa di mandata (FP)

1.Speed 1/min: 1100

Supply pump

pressure

difference bar: 0.10...0.30#

Shutoff

electromagnet Volt: 12

Inspection-pump test specifications

Test specifications in parentheses

Timing-device characteristic:

2nd speed 1/min: 1500

TD travel mm: 4.10...4.90

mm: (3.90...5.10)

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1100

TD travel mm: 3.10...3.50

mm: (2.70...3.90)

Shutoff

electromagnet Volt: 12

4th speed 1/min: 600

TD travel mm: 0.60...1.40

mm: (0.40...1.60)

Shutoff

electromagnet Volt: 12

Supply-pump pressure characteristic:

1st speed 1/min: 600

Supply-pump

pressure

bar: 4.10...4.70

Shutoff

electromagnet Volt: 12

2nd speed 1/min: 1100

Supply-pump

pressure

bar: 5.70...6.30

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1500

Supply-pump

pressure

bar: 6.90...7.50

Shutoff

electromagnet Volt: 12

Overflow quantity at overflow valve:

1st speed 1/min: 525

Shutoff

electromagnet Volt: 12

Overflow quantity cm<sup>3</sup>/10s: 69.50...111.20

(55.50...125.20)

2nd speed 1/min: 2000

Shutoff

electromagnet Volt: 12

Overflow quantity cm<sup>3</sup>/10s: 83.40...180.70

(69.40...194.70)

Delivery-quant. and breakaway char.:

2nd speed 1/min: 2450

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...5.00

1000S.: -

5th speed 1/min: 2300

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 18.00...22.00

1000S.: (15.50...24.50)

8th speed 1/min: 2200

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 32.00...40.00

1000S.: (30.00...42.00)

9th speed 1/min: 2000

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 48.00...53.00

1000S.: (47.00...54.00) D

10th speed 1/min: 1500

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 53.20...58.20

1000S.: (52.20...59.20)

12th speed 1/min: 525

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 27.00...28.00

1000S.: (24.00...31.00) F

18th speed 1/min: 1100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 54.00...55.00

1000S.: (51.00...58.00) E

Mech. shutoff:

Electr. shutoff:

1st speed 1/min: 350

Del. quantity cm<sup>3</sup>/: 0.00...3.00

1000S.: -

Idle delivery:

1st speed 1/min: 350

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 10.50...14.50

1000S.: (8.50...16.50)

Dispersion cm<sup>3</sup>/: 3.0

1000S.: (3.5)

2nd speed 1/min: 600

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...2.00

1000S.: -

3rd speed 1/min: 400

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 0.00...5.00

1000S.: -

5th speed 1/min: 300

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 26.00...36.00

1000S.: (25.00...37.00)

Load-dependent start of delivery:

Inj.-qty.dif.measurement:

3rd speed 1/min: 1100

Inj.-qty. cm<sup>3</sup>/: 16.5...24.5 \*

difference 1000S.: -

Shutoff

electromagnet Volt: 12

5th speed 1/min: 1100

Inj.-qty. cm<sup>3</sup>/: MAX. ..8.00 "

Shutoff

electromagnet Volt: 12

TD-travel dif.measurement:

correttore anticipo iniezione (SV):

1st speed 1/min: 1100

TD-travel : 0.40...0.60 \*

difference mm: -

Shutoff

electromagnet Volt: 12

3rd speed 1/min: 1100

TD-travel : 0.00...0.80 "

difference mm: -

Shutoff

electromagnet Volt: 12

Automatic starting fuel delivery:

1st speed 1/min: 350

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...60.00

1000S.: (40.00...60.00)

2nd speed 1/min: 450

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 10.00...40.00

1000S.: (10.00...40.00)

4th speed 1/min: 100

Shutoff

electromagnet Volt: 12

Del. quantity cm<sup>3</sup>/: 40.00...80.00

1000S.: (40.00...80.00)

Shutoff electromagnet:

Cut-in

min voltage : 10.0

Rated voltage : 12.0

Mounting and assembly dimensions:

Designation

K mm: -

KF mm: K-OT

MS mm: 0,0...1,2

SVS max. mm: 3,5

HBA stroke mm: 7,2

Remarks:

:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.11.92  
Replaces : 07.07.92  
Test oil : ISO-4113

Combination no. : 0 400 074 942

Injection pump  
Pump designation : PES4M55C320RS154  
EP type number : 0 410 054 971  
Governor  
Governor design. : RSF360/2300M63  
0 420 021 037  
Governor no. : 0 420 021 037

Cust. part no. : T4

Customer-spec. information  
Customer : MB

Engine : OM601 (2,0 L)

1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1,95...2,15)  
Rack travel in mm : 20.00...22.00  
Firing order : 1-3-4-2

Phasing : 0-90-180-270  
0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 11.10...11.20  
Del.quantity cm3/ : 3.1...3.2  
100 s: (3.0...3.3)  
Spread cm3 : 0.2  
100 s: (0.3)

2nd speed rpm : 375  
Rack travel in mm : 5,4...5.6  
Del.quantity cm3/ : 0.5...0.6  
100 s: (0.4...0.9)  
Spread cm3 : 0.1  
100 s: (0.15)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del.quantity : 31.0...32.0  
1000 : (30.0...33.0)  
Spread cm3 : 2.50  
1000 : (3.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...0  
3rd rack travel in: 7.80...8.20  
Speed rpm : 2500  
4th rack travel in: 2950  
Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
Rack travel in mm : 0.90...1.00

LOW IDLE 1  
Control lever

C15

(19.2...19.8°) angular displacement of cam following start of delivery of cylinder no. 1.  
Difference in start of delivery between max. and min. value = max. 1° angular displacement of cam

Testing and adjusting the control-rod-travel sensor with evaluation circuit KDEP-P400

Receiving inspection

Shift control lever to full-load stop. Set 13.5 V at stabilizer. Apply 1850 hPa to ALDA. Run up to speed of 1000 1/min; a voltage of 2,043...2,103 (2,013...2,132) V must be displayed on the digital voltmeter.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.11.92  
Replaces : 07.07.92  
Test oil : ISO-4113

Combination no. : 0 400 074 948

Injection pump  
Pump designation : PES4M55C32ORS154  
EP type number : 0 410 054 971  
Governor  
Governor design. : RSF375/2300M61  
Governor no. : 0 420 021 033

Cust. part no. : T4

Customer-spec. information  
Customer : MB

Engine : OM601 (2,0 L)

1st version kW : 53.0

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 469 990 351

Inlet press., bar : 1.00

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 2.00...2.10  
: (1,95...2,15)

Rack travel in mm : 20.00...22.00  
Firing order : 1-3-4-2

Phasing : 0-90-180-270  
0.00 (1.00)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 3.1...3.2  
100 s: (3.0...3.3)

Spread cm3 : 0.2  
100 s: (0.3)

2nd speed rpm : 375  
Rack travel in mm : 5,4...5.6  
Del.quantity cm3/ : 0.5...0.6  
100 s: (0.4...0.9)  
Spread cm3 : 0.1  
100 s: (0.15)

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Del.quantity : 31.0...32.0  
1000 : (30.0...33.0)  
Spread cm3 : 2.50  
1000 : (3.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 50...0  
3rd rack travel in: 7.80...8.20  
Speed rpm : 2500  
4th rack travel in: 2950  
Speed rpm : 0.00...1.00

## SET IDLE CONTROL LEVER POSITION

Speed rpm : 1000  
Rack travel in mm : 0.90...1.00

LOW IDLE 1  
Control lever  
position degrees: 13...17  
Setting point w/out bumper spring



1000 1/min; a voltage of 2,043...2,103  
(2,013...2,132) V must be displayed  
on the digital voltmeter.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 646 792

Injection pump  
Pump designation : PE6P120A320LS7854  
EP type number : 0 412 626 872  
Governor  
Governor design. : RQV350...1050PA1051  
Governor no. : 0 421 814 036

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 23.4...23.6  
100 s: (23.1...23.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.5...6.1  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.00...1.50  
2nd speed rpm : 453  
travel mm : 2.30...2.80  
3rd speed rpm : 770  
travel mm : 4.70...5.20  
4th speed rpm : 1108  
travel mm : 9.40...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1160  
Rack travel in mm : 12.70...15.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600

Aneroid pressure h: 1000  
Del.quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 12.90  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1155...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 250  
Minimum rack travel: 9.50  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 455...495

CONSTANT REGULATION  
Speed rpm : 380...550

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.00...10.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 275  
Rack travel in m: 10.80...10.90  
2nd pressure hPa : 580  
Rack travel in m: 12.40...12.60

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 223.0...227.0  
1000 s: (220.0...230.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm<sup>3</sup>/ : 167.0...171.0 \*  
1000 s: (164.0...174.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.90  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 10.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 794  
  
Injection pump  
Pump designation : PE6P120A320LS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQV300...1050PA1033  
-9  
Governor no. : 0 421 814 028

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 200.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.70...11.80

Del. quantity cm<sup>3</sup>/ : 18.9...19.1

100 s: (18.6...19.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del. quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.50...1.00

2nd speed rpm : 575  
travel mm : 4.30...4.80

3rd speed rpm : 625  
travel mm : 4.80...5.30

4th speed rpm : 830  
travel mm : 5.90...6.40

5th speed rpm : 1109  
travel mm : 8.20...8.70

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1160

Rack travel in mm : 9.40...12.00

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h: 800  
Del.quantity : 189.0...191.0  
1000 : (186.0...194.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 115...123

Testing:

1st rack travel in: 10.70  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 77...85

Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.90

Measurement

Speed 1/min : 500

1st pressure hPa : 200

Rack travel in m: 10.00...10.10

2nd pressure hPa : 350

Rack travel in m: 10.70...10.90

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 800  
Speed rpm : 550  
Del.quantity cm3/ : 182.0...186.0  
1000 s: (179.0...189.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.70

Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 10.92  
Test oil : ISO-4113

Combination no. : 0 402 646 795

Injection pump  
Pump designation : PE6P120A320LS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQV300...1050PA1033  
-8  
Governor no. : 0 421 814 027

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm3/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 0.50...1.00

2nd speed rpm : 575  
travel mm : 4.30...4.80

3rd speed rpm : 625  
travel mm : 4.80...5.30

4th speed rpm : 830  
travel mm : 5.90...6.40

5th speed rpm : 1109  
travel mm : 8.20...8.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1170

Rack travel in mm : 8.80...11.40

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050  
Aneroid pressure h: 700  
Del.quantity : 170.0...172.0  
1000 : (167.0...175.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version

Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 10.10  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 79...87

Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

#### CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.10...10.20 \*  
2nd pressure hPa : 300  
Rack travel in m: 10.60...10.70

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 550  
Del.quantity cm3/ : 160.0...164.0  
1000 s: (157.0...167.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 125.0...145.0  
1000 s: (121.0...149.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 09.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 797  
  
Injection pump  
Pump designation : PE6P120A320LS7858  
EP type number : 0 412 626 875  
Governor  
Governor design. : RQ300/1050PA1030-4  
Governor no. : 0 421 801 664

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 180.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.10...11.20

Del.quantity cm<sup>3</sup>/ : 17.0...17.2

100 s: (16.7...17.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 700

Del.quantity : 170.0...172.0

1000 : (167.0...175.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 10.10

Speed rpm : 1090...1105

2nd rack travel in: 4.00

Speed rpm : 1160...1190

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.2

Testing:

Speed rpm : 200

Minimum rack travel: 7.60

Speed rpm : 300

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

Speed rpm : 360...400

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 9.90...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200

Rack travel in m: 10.10...10.20 \*

2nd pressure hPa : 300

Rack travel in m: 10.60...10.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700

Speed rpm : 550

Del.quantity cm<sup>3</sup>/ : 160.0...164.0

1000 s: (157.0...167.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 130.0...132.0

1000 s: (127.0...135.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.10

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm<sup>3</sup>/ : 40.0...70.0

1000 s: (36.0...74.0)

Rack travel in mm : 9.90...10.30

Remarks:

:

\* Increase in control-rod travel with respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 m  
Edition : 03.12.92  
Replaces : 02.90  
Test oil : ISO-4113

Combination no. : 0 402 646 853

Injection pump  
Pump designation : PE6P120A320RS7138  
EP type number : 0 412 626 822  
Governor  
Governor design. : RQ200/1100PA873  
Governor no. : 0 421 801 415

Customer-spec. information  
Customer : SAAB-SCANIA

Engine : DS9 05

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 588 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 5.1...5.7

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (-)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 11.20

Speed rpm : 1145...1160

2nd rack travel in: 4.00

Speed rpm : 1300...1330

4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.40  
Speed rpm : 225  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 320...360

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in mm : 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in mm : 11.80...11.90  
3rd pressure hPa : 240  
Rack travel in mm : 11.00...11.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

#### APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 o  
Edition : 03.12.92  
Replaces : 02.90  
Test oil : ISO-4113

Combination no. : 0 402 646 875

Injection pump  
Pump designation : PE6P120A720RS7126Z  
EP type number : 0 412 626 830  
Governor  
Governor design. : RQ200/1000PA745-1  
Governor no. : 0 421 801 472

Customer spec. information  
Customer : SCANIA

Engine : DSC 11 08

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 9.00...12.00

DO2

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 20.4...20.6

100 s: (20.1...20.9)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 225.0

Rack travel in mm : 4.7...5.1

Del.quantity cm3/ : 1.8...2.2

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 204.0...206.0

1000 : (201.0...209.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 16.5

Testing:

1st rack travel in: 11.80

Speed rpm : 1045...1060

2nd rack travel in: 4.00

Speed rpm : 1180...1210

4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.8

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.30  
Speed rpm : 225  
Rack travel in mm : 4.70...4.90  
Rack travel in mm : 2.00  
Speed rpm : 310...350

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.80...12.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 470  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 320  
Rack travel in m: 11.30...11.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 197.0...205.0  
1000 s: (195.0...207.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1045...1060

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...170.0  
1000 s: (-)  
Rack travel in mm : 10.30...10.70

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.70...4.90

#### Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

#### ADDITIONAL INFORMATION

Start-of-delivery setting with ROBO  
diaphragm.

For comb. with letter index see  
VDT-I-400/116.

For sealing see VDT-I-400/117.

Test specifications approved by Scania  
on November 14, 1989

Start of delivery - engine: 9° before  
TDC

Firing sequence of engine:  
1-5-3-6-2-4.

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 11,1 r  
Edition : 03.12.92  
Replaces : 04.92  
Test oil : ISO-4113

Combination no. : 0 402 646 887

Injection pump  
Pump designation : PE6P120A72ORS7188  
EP type number : 0 412 626 832  
Governor  
Governor design. : RQV200...950PA725-7  
Governor no. : 0 421 813 803

Customer spec. information  
Customer : SCANIA

Engine : DSC 11 23

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.80...13.90

Del.quantity cm<sup>3</sup>/ : 25.1...25.3

100 s: (24.8...25.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.6...5.0

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (-)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.40...3.00

3rd speed rpm : 650

travel mm : 4.50...5.10

4th speed rpm : 1045

travel mm : 8.40...8.60

5th speed rpm : 1125

travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 7.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1500

Del.quantity : 251.0...253.0

1000 : (248.0...256.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 12.80  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 60...68

Testing:  
Speed rpm : 125  
Minimum rack travel: 6.20  
Speed rpm : 250  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 370...430

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 13.80...13.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.20...10.60  
2nd pressure hPa : 440  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 270  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm3/ : 228.0...236.0  
1000 s: (226.0...238.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 152.0...154.0  
1000 s: (149.0...157.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...180.0  
1000 s: (-)  
Rack travel in mm : 10.20...10.60

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

#### APPLICATION

Navy

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 9,0 L 4  
Edition : 30.10.92  
Replaces : 12.91  
Test oil : ISO-4113

Combination no. : 0 402 646 909

Injection pump  
Pump designation : PE6P120A32ORS713SZ  
EP type number : 0 412 626 856  
Governor  
Governor design. : RGV200...1100PA712-5  
Governor no. : 0 421 813 951

Customer-spec. information  
Customer : SCANIA

Engine : DS9 07

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 11.80...11.90

Del.quantity cm<sup>3</sup>/ : 15.0...15.2

100 s: (14.7...15.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.5...4.9

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (-)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225  
travel mm : 0.90...1.30

2nd speed rpm : 350  
travel mm : 2.50...3.10

3rd speed rpm : 650  
travel mm : 5.40...6.00

4th speed rpm : 1145  
travel mm : 8.90...9.10

5th speed rpm : 1280  
travel mm : 10.10...10.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 150.0...152.0

1000 : (147.0...155.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 10.80  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1270...1300  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.10  
Speed rpm : 250  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 310...370

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.80...11.90

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 350  
Rack travel in m: 11.50...11.60  
3rd pressure hPa : 220  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm3/ : 145.0...153.0  
1000 s: (143.0...155.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 114.0...118.0  
1000 s: (112.0...120.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...145.0  
1000 s: (-)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 03.12.92  
Replaces : 09.92  
Test oil : ISO-4113  
Combination no. : 0 402 646 910  
Injection pump  
Pump designation : PE6P120A320RS7138  
EP type number : 0 412 626 822  
Governor  
Governor design. : RQV200...1100PA712-5  
Governor no. : 0 421 813 951

Customer-spec. information  
Customer : SCANIA

Engine : DS9 08

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

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Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 18.0...18.2

100 s: (17.7...18.5)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.9...5.1

Del.quantity cm3/ : 1.2...1.6

100 s: (-)

Spread cm3 : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 0.90...1.30

2nd speed rpm : 350

travel mm : 2.50...3.10

3rd speed rpm : 650

travel mm : 5.40...6.00

4th speed rpm : 1145

travel mm : 8.90...9.10

5th speed rpm : 1280

travel mm : 10.10...10.50

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 180.0...182.0

1000 : (177.0...185.0)

Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 114...122

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 61...69

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.50  
Speed rpm : 250  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 480  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 220  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 114.0...118.0  
1000 s: (112.0...120.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1140...1150

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 120.0...140.0  
1000 s: (-)  
Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.90...5.10

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 921X  
  
Injection pump  
Pump designation : PE6P120A320LS7837-10  
EP type number : 0 412 626 855  
Governor  
Governor design. : RQ300/1050PA972-3  
Governor no. : 0 421 801 565

Cust. part no. : 0200741202

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 244.0...246.0

1000 : (241.0...249.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

#### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 13.80  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1185...1215  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

### LOW IDLE 1

#### Setting point w/out bumper spring

Speed rpm : 300  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00

### Aneroid/Altitude Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 9.50...9.60  
2nd pressure hPa : 550  
Rack travel in m: 13.20...13.40

### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050

Del.quantity cm<sup>3</sup>/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

### BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1090...1105

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 60.0...90.0  
1000 s: (56.0...94.0)  
Rack travel in mm : 8.90...9.30

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 924X  
  
Injection pump  
Pump designation : PE6P120A320LS7837-10  
EP type number : 0 412 626 855  
Governor  
Governor design. : RQ300/950PA971-3  
Governor no. : 0 421 801 557

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM401 LA

1st version kW : 250.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del.quantity cm<sup>3</sup>/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 244.0...246.0

1000 : (241.0...249.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.00

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1080...1110

4th rack travel in: 1200

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.9

Testing:

Speed rpm : 200

Minimum rack travel: 8.20

Speed rpm : 300

Rack travel in mm : 5.80...6.00

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : -

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 15.00...15.10

2nd speed rpm : 950

Rack travel in m: 15.00...15.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 150

Rack travel in m: 9.50...9.60

2nd pressure hPa : 550

Rack travel in m: 13.20...13.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 14.00

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 65.0...95.0

1000 s: (61.0...99.0)

Rack travel in mm : 8.90...9.30

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 925X  
  
Injection pump  
Pump designation : PE6P120A320LS7837-10  
EP type number : 0 412 626 855  
Governor  
Governor design. : RQV300...950PA797-20  
Governor no. : 0 421 813 893

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 683 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50

2nd speed rpm : 567  
travel mm : 4.40...4.90

3rd speed rpm : 780  
travel mm : 6.10...6.60

4th speed rpm : 1009  
travel mm : 8.30...8.80

5th speed rpm : 1190  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1

Speed rpm : 1025

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1200  
Del.quantity : 244.0...246.0  
1000 : (241.0...249.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 120...128

Testing:  
1st rack travel in: 14.00  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1085...1115  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.60...6.20

CONSTANT REGULATION  
Speed rpm : 300...450

TORQUE CONTROL  
Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 950  
Rack travel in m: 15.00...15.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

Measurement  
Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 9.50...9.60  
2nd pressure hPa : 550  
Rack travel in m: 13.20...13.40

#### START CUT-OUT

Speed 1/min : 240 (260)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 3.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.00  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 646 928

Injection pump  
Pump designation : PE6P120A320RS7138  
EP type number : 0 412 626 822  
Governor  
Governor design. : RQV350...1100PA795  
-12  
Governor no. : 0 421 813 914

Customer-spec. information  
Customer : SCANIA

Engine : DS9 05

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.20...12.30

Del.quantity cm3/ : 16.5...16.7

100 s: (16.2...17.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.7...5.3

Del.quantity cm3/ : 2.0...2.4

100 s: (-)

Spread cm3 : 0.3

100 s: (0.6)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

2nd speed rpm : 350

travel mm : 1.30...1.70

3rd speed rpm : 650

travel mm : 4.10...4.70

4th speed rpm : 1150

travel mm : 7.80...8.00

5th speed rpm : 1260

travel mm : 8.80...9.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1230

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 165.0...167.0

1000 : (162.0...170.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 99...107

### Testing:

1st rack travel in: 11.20  
Speed rpm : 1140...1150  
2nd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

### LOW IDLE 1

Control lever  
position degrees: 68...76

### Testing:

Speed rpm : 100  
Minimum rack travel: 10.30  
Speed rpm : 350  
Rack travel in mm : 4.50...4.70  
Rack travel in mm : 2.00  
Speed rpm : 370...430

Aneroid/Altitude  
Compensator Test

### 1st version

#### Setting

Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.20...12.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.60...11.00  
2nd pressure hPa : 360  
Rack travel in m: 11.80...11.90  
3rd pressure hPa : 250  
Rack travel in m: 11.10...11.30

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 900  
Speed rpm : 1100  
Del.quantity cm<sup>3</sup>/ : 163.0...171.0  
1000 s: (161.0...173.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 125.0...129.0  
1000 s: (122.0...132.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1140...1150

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 270.0...320.0  
1000 s: (-)  
Rack travel in mm : 20.00...21.00

## LOW IDLE

Speed rpm : 350  
Rack travel in mm : 4.50...4.70

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 27.11.92  
 Replaces : -  
 Test oil : ISO-4113

Combination no. : 0 402 646 931X

Injection pump  
 Pump designation : PE6P120A320LS7837-10  
 EP type number : 0 412 626 855  
 Governor  
 Governor design. : RQV300...1050PA797  
 -24  
 Governor no. : 0 421 813 911

Cust. part no. : 0200748302

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

---

Rack travel in mm : 15.00...15.10

---

Del.quantity cm3/ : 24.4...24.6

---

100 s: (24.1...24.9)

---

Spread cm3 : 0.5

---

100 s: (0.9)

---

2nd speed rpm : 300.0  
 Rack travel in mm : 5.6...6.2  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50  
 2nd speed rpm : 608  
 travel mm : 4.80...5.30  
 3rd speed rpm : 820  
 travel mm : 5.90...6.40  
 4th speed rpm : 1108  
 travel mm : 8.30...8.80  
 5th speed rpm : 1280  
 travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1100  
Rack travel in mm : 15.20...17.80

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 600  
Aneroid pressure h: 1200  
Del.quantity : 244.0...246.0  
1000 : (241.0...249.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 118...126

##### Testing:

1st rack travel in: 13.80  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 81...89

##### Testing:

Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00

#### CONSTANT REGULATION

Speed rpm : 300...550

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00

#### Aneroid/Altitude

##### Compensator Test

##### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

#### Measurement

Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 9.50...9.60  
2nd pressure hPa : 550  
Rack travel in m: 13.20...13.40

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF 11,7 n  
 Edition : 27.11.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 936  
 Injection pump  
 Pump designation : PE6P120A32ORS7230  
 EP type number : 0 412 626 843  
 Governor  
 Governor design. : RQV250...1000PA990K  
 Governor no. : 0 421 815 274

Customer-spec. information  
 Customer : DAF

Engine : WS 315 G

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
 : (4.95...5.15)  
 Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 14.20...14.30

Del. quantity cm<sup>3</sup>/ : 26.4...26.6

100 s: (26.1...26.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 5.8...6.0

Del. quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.30...1.70

2nd speed rpm : 285

travel mm : 2.10...2.50

3rd speed rpm : 685

travel mm : 6.20...6.60

4th speed rpm : 1030

travel mm : 9.60...10.00

5th speed rpm : 1145

travel mm : 11.20...11.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 12.90...15.50

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 980

Aneroid pressure h: 1500

Del. quantity : 264.0...266.0

1000 : (261.0...269.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 115...123

Testing:  
1st rack travel in: 13.20  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1140...1170  
4th rack travel in: 1275  
Speed rpm : 0.00...1.40

LOW IDLE 1  
Control lever  
position degrees: ?

Testing:  
Speed rpm : 150  
Minimum rack travel: 6.70  
Speed rpm : 250  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 310...350

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 500  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 600  
Rack travel in m: 13.00...13.20  
3rd speed rpm : 750  
Rack travel in m: 13.40...13.60  
4th speed rpm : 825  
Rack travel in m: 13.80...14.00  
5th speed rpm : 980  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 980  
Pressure hPa : 1500  
Rack travel mm : 14.20...14.30

Measurement  
Speed 1/min : 980

1st pressure hPa : -  
Rack travel in m: 8.80...9.00  
2nd pressure hPa : 630  
Rack travel in m: 12.80...12.90

3rd pressure hPa : 340  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 500  
Del.quantity cm3/ : 288.0...292.0  
1000 s: (285.0...295.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 162.0...164.0  
1000 s: (159.0...167.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1030...1040

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.10...5.30

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 30.10.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 646 937  
Injection pump  
Pump designation : PE6P120A72ORS71880  
EP type number : 0 412 626 346  
Governor  
Governor design. : RQV200...950PA725-7  
Governor no. : 0 421 813 803

Customer-spec. information  
Customer : SCANIA

Engine : DSC11 21

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 104  
Opening  
pressure, bar : 250...253  
Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.70...12.80

Del.quantity cm3/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 225.0

Rack travel in mm : 4.6...5.2

Del.quantity cm3/ : 1.5...1.9

100 s: (-)

Spread cm3 : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 1.20...1.60

2nd speed rpm : 350

travel mm : 2.40...3.00

3rd speed rpm : 650

travel mm : 4.50...5.10

4th speed rpm : 1045

travel mm : 8.40...8.60

5th speed rpm : 1125

travel mm : 9.30...9.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 7.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 1500

Del.quantity : 219.0...221.0

1000 : (216.0...224.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 11.70  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 58...66

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 225  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 350...410

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1500  
Rack travel mm : 12.70...12.80

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.30...10.70  
2nd pressure hPa : 440  
Rack travel in m: 12.00...12.10  
3rd pressure hPa : 270  
Rack travel in m: 10.90...11.10

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 950  
Del.quantity cm3/ : 202.0...210.0  
1000 s: (200.0...212.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 151.0...155.0  
1000 s: (149.0...157.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...180.0  
1000 s: (-)  
Rack travel in mm : 10.30...10.70

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.60...4.80

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm.

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 30.10.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 938  
  
Injection pump  
Pump designation : PE6P120A72ORS71880  
EP type number : 0 412 626 846  
Governor  
Governor design. : RQ200/950PA745-3  
Governor no. : 0 421 801 579

Customer-spec. information  
Customer : SCANIA

Engine : DSC 11 21

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 417 413 025  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 1 688 901 104  
  
Opening  
pressure, bar : 250...253  
  
Orifice plate  
diameter mm : 0,7  
  
Test lines : 1 680 750 008  
  
Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600  
  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27  
  
Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
  
Rack travel in mm : 12.20...12.30  
  
Del. quantity cm<sup>3</sup>/ : 21.9...22.1  
100 s: (21.6...22.4)  
  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

2nd speed rpm : 225.0  
Rack travel in mm : 4.3...4.7  
Del. quantity cm<sup>3</sup>/ : 1.5...1.9  
100 s: (-)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 600  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 1500  
Del. quantity : 219.0...221.0  
1000 : (216.0...224.0)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

## RATED SPEED

1st version  
  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 11.20  
Speed rpm : 995...1010  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140

4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 225

Rack travel in mm : 4.4

#### Testing:

Speed rpm : 100

Minimum rack travel: 5.90

Speed rpm : 225

Rack travel in mm : 4.30...4.50

Rack travel in mm : 2.00

Speed rpm : 290...350

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500

Pressure hPa : 1500

Rack travel mm : 12.20...12.30

##### Measurement

Speed 1/min : 500

1st pressure hPa : -

Rack travel in m: 9.90...10.30

2nd pressure hPa : 440

Rack travel in m: 11.50...11.60

3rd pressure hPa : 270

Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1500

Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 202.0...210.0

1000 s: (200.0...212.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 151.0...155.0

1000 s: (149.0...157.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.20

Speed rpm : 995...1010

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 160.0...200.0  
1000 s: (-)

Rack travel in mm : 9.90...10.30

#### LOW IDLE

Speed rpm : 225

Rack travel in mm : 4.30...4.50

Remarks:

:

Delivery-valve spring pre-tension

3.2...3.4 mm.

Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 27.11.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 646 942X  
 Injection pump  
 Pump designation : PE6P120A320LS7837-10  
 EP type number : 0 412 626 855  
 Governor  
 Governor design. : RQ300/1050PA993  
 Governor no. : 0 421 801 581  
 Cust. part no. : 0200747102  
 Customer-spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM441 LA  
 1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del.quantity cm3/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...6.2

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 244.0...246.0

1000 : (241.0...249.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.80  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300  
Rack travel in mm : 5.9

Testing:

Speed rpm : 200  
Minimum rack travel: 8.10  
Speed rpm : 300  
Rack travel in mm : 5.80...6.00  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 1050  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 800

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 9.50...9.60  
2nd pressure hPa : 550  
Rack travel in m: 13.20...13.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 234.0...238.0  
1000 s: (231.0...241.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.80  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN 7,2 a  
Edition : 30.10.92  
Replaces : 09.92  
Test oil : ISO-4113

Combination no. : 0 402 646 948

Injection pump  
Pump designation : PE6P120A320RS7233-1  
EP type number : 0 412 626 849  
Governor  
Governor design. : RQV300...1300PA1003K  
Governor no. : 0 421 815 281

Customer-spec. information  
Customer : PENTA

Engine : TAMO 72 A

1st version kW : 316.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 457 413 010

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 3.30...3.40  
: (3.25...3.45)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 24.9...25.1

100 s: (24.6...25.4)

Spread cm3 : 0.6

100 s: (1.0)

2nd speed rpm : 290.0

Rack travel in mm : 5.8...6.0

Del.quantity cm3/ : 1.5...2.1  
100 s: (1.3...2.3)

Spread cm3 : 0.7

100 s: (1.1)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 275

travel mm : 1.30...1.50

2nd speed rpm : 325

travel mm : 2.00...2.20

3rd speed rpm : 475

travel mm : 3.20...3.40

4th speed rpm : 890

travel mm : 6.30...6.50

5th speed rpm : 1350

travel mm : 9.90...10.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1500

Rack travel in mm : 6.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 2400

Del.quantity : 249.0...251.0  
1000 : (246.0...254.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Testing:

1st rack travel in: 12.80  
Speed rpm : 1335...1345  
2nd rack travel in: 4.00  
Speed rpm : 1460...1490  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 75...79

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 290  
Rack travel in mm : 5.80...6.00

#### CONSTANT REGULATION

Speed rpm : 300...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 13.80...13.90  
2nd speed rpm : 1200  
Rack travel in m: 13.40...13.70  
3rd speed rpm : 1000  
Rack travel in m: 12.30...12.70  
4th speed rpm : 800  
Rack travel in m: 11.40...11.60

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : 2400  
Rack travel mm : 13.80...13.90

#### Measurement

Speed 1/min : 1300

1st pressure hPa : -  
Rack travel in m: 7.20...7.50  
2nd pressure hPa : 350

E01

Rack travel in m: 7.40...7.50 \*

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 2400  
Speed rpm : 800  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (231.0...241.0)  
Spread cm3 : 9.00  
1000 s: (13.0)  
Aneroid pressure h: 2400  
Speed rpm : 1000  
Del.quantity cm3/ : 240.0...248.0  
1000 s: (238.0...250.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 112.0...114.0  
1000 s: (109.0...117.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than  
full load rack tr: 12.80  
Speed rpm : 1335...1345

#### LOW IDLE

Speed rpm : 290  
Rack travel in mm : 5.80...6.00  
Del.quantity cm3/ : 15.0...21.0  
1000 s: (13.0...23.0)  
Spread cm3 : 7.00  
1000 s: (11.00)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 646 950X  
  
Injection pump  
Pump designation : PE6P120A320LS7837-10  
EP type number : 0 412 626 855  
Governor  
Governor design. : RQ300/950PA993-2  
Governor no. : 0 421 801 590

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM441 LA

1st version kW : 250.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 5- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 15.00...15.10

Del.quantity cm<sup>3</sup>/ : 24.4...24.6

100 s: (24.1...24.9)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 244.0...246.0

1000 : (241.0...249.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 14.00  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 15.00...15.10  
2nd speed rpm : 950  
Rack travel in m: 15.00...15.10

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 9.50...9.60  
2nd pressure hPa : 550  
Rack travel in m: 13.20...13.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)

Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.00  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 30.10.92  
Replaces : 07.92  
Test oil : ISO-4113  
Combination no. : 0 402 646 951  
Injection pump  
Pump designation : PE6P120A72ORS7188  
EP type number : 0 412 626 832  
Governor  
Governor design. : RQ200/950PA745-3  
Governor no. : 0 421 801 579

Customer-spec. information  
Customer : SCANIA

Engine : DSC 11 77

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 104  
Opening  
pressure, bar : 250...253  
Orifice plate  
diameter mm : 0,7  
Test lines : 1 680 750 008  
Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.40...4.50  
: (4.35...4.55)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
Rack travel in mm : 11.10...11.20  
Del.quantity cm<sup>3</sup>/ : 17.0...17.2  
100 s: (16.8...17.4)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)  
2nd speed rpm : 225.0  
Rack travel in mm : 4.5...5.3  
Del.quantity cm<sup>3</sup>/ : 1.2...1.6  
100 s: (-)  
Spread cm<sup>3</sup> : 0.4  
100 s: (0.8)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 600  
Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 900  
Del.quantity : 170.0...172.0  
1000 : (168.0...174.0)  
Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 16.5  
Testing:  
1st rack travel in: 11.70  
Speed rpm : 995...1010  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140

4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 225  
Rack travel in mm : 4.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.20  
Speed rpm : 225  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.10...11.30

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.30...9.70  
2nd pressure hPa : 420  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 280  
Rack travel in m: 9.80...10.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 170.0...172.0  
1000 s: (168.0...174.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 120.0...124.0  
1000 s: (118.0...126.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 995...1010

#### STARTING FUEL DELIVERY

E05

Speed rpm : 100  
Rack travel in mm : 9.30...9.70

#### LOW IDLE

Speed rpm : 225  
Rack travel in mm : 4.50...5.10

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with RO80  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 30.10.92  
Replaces : 06.92  
Test oil : ISO-4113  
Combination no. : 0 402 646 984  
Injection pump  
Pump designation : PE6P120A320RS7243  
EP type number : 0 412 626 861  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 222 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 1 688 901 105  
Opening  
pressure, bar : 207...210  
Orifice plate  
diameter mm : 0,8  
Test lines : 1 680 750 089  
Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600  
(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00

EO6

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 11.7...12.7  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 12.20...12.30  
Del.quantity cm<sup>3</sup>/ : 18.4...18.6  
100 s: (18.1...18.9)  
Spread cm<sup>3</sup> : 0.5  
100 s: (0.9)  
2nd speed rpm : 275.0  
Rack travel in mm : 5.3...5.5  
Del.quantity cm<sup>3</sup>/ : 1.3...1.9  
100 s: (1.0...2.2)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 550  
Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 184.0...186.0  
1000 : (181.0...189.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 550  
Rack travel in mm : 15.8

Testing:

1st rack travel in: 11.20  
Speed rpm : 1200...1215  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 4.7

Testing:

Speed rpm : 175  
Minimum rack travel: 7.50  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...360

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 12.20...12.30

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.30...9.50  
2nd pressure hPa : 420  
Rack travel in m: 11.60...11.70  
3rd pressure hPa : 240  
Rack travel in m: 10.30...10.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 120.0...122.0  
1000 s: (117.0...125.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 11.20  
Speed rpm : 1200...1215

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.11.92  
Replaces : 06.92  
Test oil : ISO-4113

Combination no. : 0 402 646 985

Injection pump  
Pump designation : PE6P120A32ORS7248Z  
EP type number : 0 412 626 862  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 200 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00

E08

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 10.8...11.8  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.30...11.40

Del.quantity cm3/ : 13.4...16.6

100 s: (16.1...16.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 164.0...166.0

1000 : (161.0...169.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 10.30  
Speed rpm : 1200...1215  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 4.7

Testing:

Speed rpm : 175  
Minimum rack travel: 7.00  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...360

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 11.30...11.40

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.00...9.20  
2nd pressure hPa : 340  
Rack travel in m: 10.70...10.80  
3rd pressure hPa : 200  
Rack travel in m: 9.60...9.80

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 115.0...117.0  
1000 s: (112.0...120.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 10.30  
Speed rpm : 1200...1215

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 30.10.92  
Replaces : 06.92  
Test oil : ISO-4113

Combination no. : 0 402 646 986

Injection pump  
Pump designation : PE6P120A32ORS7248Y  
EP type number : 0 412 626 863  
Governor  
Governor design. : RQ275/1150PA987  
Governor no. : 0 421 801 578

Customer-spec. information  
Customer : DAF

Engine : RS 180 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 14.00...15.00

E10

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 10.2...11.2  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.80

Del.quantity cm3/ : 14.5...14.7

100 s: (14.2...15.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 5.3...5.5

Del.quantity cm3/ : 1.3...1.9

100 s: (1.0...2.2)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.20...16.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 145.5...147.5

1000 : (142.5...150.5)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 15.8

Testing:

1st rack travel in: 9.70  
Speed rpm : 1200...1215  
2nd rack travel in: 4.00  
Speed rpm : 1275...1305  
4th rack travel in: 1450  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 4.7

Testing:

Speed rpm : 175  
Minimum rack travel: 7.00  
Speed rpm : 275  
Rack travel in mm : 4.60...4.80  
Rack travel in mm : 2.00  
Speed rpm : 320...360

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 10.70...10.80

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 9.40...9.60  
2nd pressure hPa : 260  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 190  
Rack travel in m: 9.80...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 119.0...121.0  
1000 s: (116.0...124.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1200...1215

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.60...4.80

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.11.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 402 646 987

Injection pump  
Pump designation : PE6P120A320RS7218Y  
EP type number : 0 412 626 859  
Governor  
Governor design. : RQ275/1000PA936-2  
Governor no. : 0 421 801 633

Customer-spec. information  
Customer : DAF

Engine : WS 222 L

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.30...5.40  
: (5.25...5.45)  
Rack travel in mm : 14.00...15.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 4.90...5.10  
& maximum rack tra: 14.0...15.0  
Difference ° CS : 2.25...3.75

## BASIC SETTING

1st speed rpm : 850

Rack travel in mm : 13.70...13.80

Del.quantity cm<sup>3</sup>/ : 19.5...19.7

100 s: (19.2...20.0)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 550

Rack travel in mm : 15.40...16.60

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 850

Aneroid pressure h: 1000

Del.quantity : 195.0...197.0

1000 : (192.0...200.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

### 1st version

Setting point:

Speed rpm : 550

Rack travel in mm : 16.0

Testing:

1st rack travel in: 12.70  
Speed rpm : 1035...1050  
2nd rack travel in: 4.00  
Speed rpm : 1130...1160  
4th rack travel in: 1250  
Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.0

Testing:

Speed rpm : 175  
Minimum rack travel: 7.00  
Speed rpm : 275  
Rack travel in mm : 4.90...5.10  
Rack travel in mm : 2.00  
Speed rpm : 330...370

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 850  
Rack travel in m: 14.70...14.80  
2nd speed rpm : 1000  
Rack travel in m: 14.60...14.80

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 11.60...11.80  
2nd pressure hPa : 400  
Rack travel in m: 13.20...13.30  
3rd pressure hPa : 230  
Rack travel in m: 12.00...12.20

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 139.0...141.0  
1000 s: (136.0...144.0)

BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1035...1050

LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.10

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 k  
Edition : 18.09.91  
Replaces : G7.90  
Test oil : ISO-4113

Combination no. : 0 402 648 845

Injection pump  
Pump designation : PE8P120A320LS7816  
EP type number : 0 412 628 829  
Governor  
Governor design. : RQV300...1050PA797-5  
Governor no. : 0 421 813 702

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del. quantity cm3/ : 23.6...23.9  
100 s: (23.3...24.2)

Spread cm3 : 0.4  
100 s: (0.7)

2nd speed rpm : 300.0  
Rack travel in mm : 5.9...6.5  
Del. quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.5  
100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.20...1.40  
2nd speed rpm : 800  
travel mm : 5.80...6.10  
3rd speed rpm : 1120  
travel mm : 8.20...8.80  
4th speed rpm : 1180  
travel mm : 9.60...10.40

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1100  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 236.0...239.0  
1000 : (233.0...242.0)  
Spread cm3 : 4.00  
1000 : (7.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : 1.30  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.80 \*

4th pressure hPa : 1350  
Rack travel in m: 15.00...15.20  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 265.0...269.0  
1000 s: (262.0...272.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 845

Injection pump  
Pump designation : PE8P120A32JLS7816-10  
EP type number : 0 412 628 836  
Governor  
Governor design. : RQV300...1050PA797-5  
Governor no. : 0 421 813 702

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 353.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 23.6...23.9

100 s: (23.3...24.2)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 300.0

Rack travel in mm : 5.9...6.5

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.5

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.20...1.40

2nd speed rpm : 800  
travel mm : 5.80...6.10

3rd speed rpm : 1120  
travel mm : 8.20...8.80

4th speed rpm : 1180  
travel mm : 9.60...10.40

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1100

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 236.0...239.0  
1000 : (233.0...242.0)  
Spread cm3 : 4.00  
1000 : (7.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 13.40  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 82...90

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.90...6.50

CONSTANT REGULATION  
Speed rpm : 300...500

TORQUE CONTROL  
Dimension a mm : 1.30  
2nd speed rpm : 1050  
Rack travel in m: 14.40...14.60  
3rd speed rpm : 800  
Rack travel in m: 14.90...15.10

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.60...13.80

Measurement  
Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 650  
Rack travel in m: 12.80...13.00  
3rd pressure hPa : 1050  
Rack travel in m: 13.70...13.80 \*

4th pressure hPa : 1350  
Rack travel in m: 15.00...15.20  
5th pressure hPa : -  
Rack travel in m: 10.20...10.50

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1600  
Speed rpm : 1050  
Del.quantity cm3/ : 248.0...252.0  
1000 s: (245.0...255.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 265.0...269.0  
1000 s: (262.0...272.0)  
Spread cm3 : 7.00  
1000 s: (10.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm3 : 7.00  
1000 s: (10.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.40  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : FIA 17,2 e  
Edition : 27.11.92  
Replaces : 09.91  
Test oil : ISO-4113

Combination no. : 0 402 648 854

Injection pump  
Pump designation : PE8P130A920/5LS7822  
EP type number : 0 412 638 802  
Governor  
Governor design. : RGV300...950PA905  
Governor no. : 0 421 813 723

Customer-spec. information  
Customer : IVECO-FIAT

Engine : 8280.42.001

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 40...45

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 688 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
: (5.05...5.25)

Rack travel in mm : 9.00...12.00

Firing order : 1- 8- 4- 3- 6- 5-  
7- 2

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 11.40...11.50

Del. quantity cm<sup>3</sup>/ : 22.1...22.3

100 s: (21.8...22.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.5

Del. quantity cm<sup>3</sup>/ : 2.4...3.0

100 s: (2.0...3.4)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 225

travel mm : 0.60...1.10

2nd speed rpm : 350

travel mm : 2.10...2.50

3rd speed rpm : 600

travel mm : 3.80...4.40

4th speed rpm : 950

travel mm : 7.20...7.40

5th speed rpm : 1200

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 900

Del. quantity : 221.0...223.0

1000 : (218.0...226.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 109...117

Testing:  
1st rack travel in: 10.40  
Speed rpm : 995...1005  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 63...71

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.70  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION  
Speed rpm : 380...480

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.40...11.50

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.40...9.70  
2nd pressure hPa : 390  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 330  
Rack travel in m: 9.80...10.00

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm3/ : 215.0...221.0  
1000 s: (212.0...224.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 161.0...163.0  
1000 s: (158.0...166.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.40  
Speed rpm : 995...1005

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...270.0  
1000 s: (236.0...274.0)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA  
Edition : 30.10.92  
Replaces : 04.92  
Test oil : ISO-4113

Combination no. : 0 402 648 874

Injection pump  
Pump designation : PE8P120A920/4LS7189  
EP type number : 0 412 628 840  
Governor  
Governor design. : RQV200...950PA736-8  
Governor no. : 0 421 813 815

Customer-spec. information  
Customer : SCANIA

Engine : DSC14 10

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
6- 8

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 23.7...23.9

100 s: (23.4...24.2)

Spread cm3 : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.4...4.8

Del.quantity cm3/ : 1.2...1.6

100 s: (-)

Spread cm3 : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.40...1.80

2nd speed rpm : 350

travel mm : 2.30...2.90

3rd speed rpm : 650

travel mm : 4.40...5.00

4th speed rpm : 995

travel mm : 7.70...7.90

5th speed rpm : 1115

travel mm : 9.20...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 7.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 237.0...239.0

1000 : (234.0...242.0)

Spread cm3 : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 90...98

#### Testing:

1st rack travel in: 12.00  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 41...49

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.00  
Speed rpm : 250  
Rack travel in mm : 4.40...4.60  
Rack travel in mm : 2.00  
Speed rpm : 375...435

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 13.00...13.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 525  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 320  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm3/ : 220.0...228.0  
1000 s: (218.0...230.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...180.0  
1000 s: (-)  
Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with ROBO  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : SCA 14,2 o  
Edition : 30.10.92  
Replaces : 11.91  
Test oil : ISO-4113

Combination no. : 0 402 648 891

Injection pump  
Pump designation : PE8P120A920/4LS7189Q  
EP type number : 0 412 628 858  
Governor  
Governor design. : RQV200...950PA736-8  
Governor no. : 0 421 813 815

Customer-spec. information  
Customer : SCANIA

Engine : DSC14 08

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 104

Opening  
pressure, bar : 250...253

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 2- 7- 3- 4- 5-  
6- 8

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 21.9...22.1

100 s: (21.6...22.4)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

2nd speed rpm : 250.0

Rack travel in mm : 4.4...4.8

Del.quantity cm<sup>3</sup>/ : 1.2...1.6

100 s: (-)

Spread cm<sup>3</sup> : 0.4

100 s: (0.8)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 1.40...1.80

2nd speed rpm : 350

travel mm : 2.30...2.90

3rd speed rpm : 650

travel mm : 4.40...5.00

4th speed rpm : 995

travel mm : 7.70...7.90

5th speed rpm : 1115

travel mm : 9.20...9.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 7.00...12.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Aneroid pressure h: 900

Del.quantity : 219.0...221.0

1000 : (216.0...224.0)

Spread cm<sup>3</sup> : 8.00  
1000 : (12.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 90...98

Testing:  
1st rack travel in: 11.30  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1090...1120  
4th rack travel in: 1250  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 40...48

Testing:  
Speed rpm : 100  
Minimum rack travel: 6.00  
Speed rpm : 250  
Rack travel in mm : 4.40...4.60  
Rack travel in mm : 2.00  
Speed rpm : 375...435

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.30...12.40

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.20  
2nd pressure hPa : 525  
Rack travel in m: 11.70...11.80  
3rd pressure hPa : 320  
Rack travel in m: 10.40...10.60

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 202.0...210.0  
1000 s: (200.0...212.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 142.0...146.0  
1000 s: (140.0...148.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 990...1000

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...180.0  
1000 s: (-)  
Rack travel in mm : 9.80...10.20

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.40...4.60

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Start-of-delivery setting with R080  
diaphragm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 898X

Injection pump  
Pump designation : PE8P120A320LS7838-10  
EP type number : 0 412 628 854  
Governor  
Governor design. : RQ300/950PA971-4  
Governor no. : 0 421 801 558

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 320.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.40...14.50

Del.quantity cm<sup>3</sup>/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 235.0...237.0

1000 : (232.0...240.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.20

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1070...1100

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.5

Testing:

Speed rpm : 200

Minimum rack travel: 7.80

Speed rpm : 300

Rack travel in mm : 6.40...6.60

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 600

Rack travel in m: 14.40...14.50

2nd speed rpm : 950

Rack travel in m: 14.20...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 250

Rack travel in m: 9.70...9.80

2nd pressure hPa : 550

Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 950

Del.quantity cm<sup>3</sup>/ : 230.0...234.0

1000 s: (227.0...237.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm<sup>3</sup> : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Rack travel in mm : 8.90...9.30

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 06.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 899  
  
Injection pump  
Pump designation : PE8P120A320LS7839-10  
EP type number : 0 412 628 855  
Governor  
Governor design. : RQ300/950PA971-5  
Governor no. : 0 421 801 559

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm<sup>3</sup>/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1075...1105

4th rack travel in: 1150

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.3

Testing:

Speed rpm : 200

Minimum rack travel: 7.60

Speed rpm : 300

Rack travel in mm : 6.20...6.40

Rack travel in mm : 2.00

Speed rpm : 370...410

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 900

Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250

Rack travel in m: 9.90...10.10

2nd pressure hPa : 700

Rack travel in m: 13.90...14.10

3rd pressure hPa : 1100

Rack travel in m: 15.10...15.20

4th pressure hPa : 1400

Rack travel in m: 15.70...15.90

5th pressure hPa : -

Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000

Speed rpm : 950

Del.quantity cm3/ : 279.0...282.0

1000 s: (276.0...285.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 2000

Speed rpm : 800

Del.quantity cm3/ : 286.0...290.0

1000 s: (283.0...293.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.30

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 80.0...100.0

1000 s: (76.0...104.0)

Rack travel in mm : 9.10...9.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 08.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 902  
  
Injection pump  
Pump designation : PE8P12UA320LS7839-10  
EP type number : 0 412 628 855  
Governor  
Governor design. : RQ300/1050PA972-5  
Governor no. : 0 421 801 564

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.20  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1150...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 16.20...16.40  
3rd speed rpm : 800  
Rack travel in m: 16.40...16.60

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 700  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1100  
Rack travel in m: 15.10...15.20  
4th pressure hPa : 1400  
Rack travel in m: 15.70...15.90  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 1050

F01

Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del.quantity cm3/ : 276.0...280.0  
1000 s: (273.0...283.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 15.20  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 9.10...9.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 906X  
  
Injection pump  
Pump designation : PE8P120A320LS7838-10  
EP type number : 0 412 628 854  
Governor  
Governor design. : RG300/1050PA972-6  
Governor no. : 0 421 801 569

Cust. part no. : 0200743602

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 23.7...23.9

100 s: (23.4...24.2)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1200

Del.quantity : 237.0...239.0

1000 : (234.0...242.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.20  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 1050  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 600  
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

F03

Speed rpm : 1050  
Del.quantity cm3/ : 222.0...226.0  
1000 s: (219.0...229.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 1090...1105

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 30.10.92  
Replaces : 07.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 907  
  
Injection pump  
Pump designation : PE8P120A32OLS?839-10  
EP type number : 0 412 628 855  
Governor  
Governor design. : RGV300...950PA797-22  
Governor no. : 0 421 813 909

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
  
Rack travel in mm : 14.90...15.10  
  
Del.quantity cm3/ : 25.6...25.8  
100 s: (25.3...26.1)

Spread cm3 : 0.6  
100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 6.0...6.6  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50  
2nd speed rpm : 617  
travel mm : 5.00...5.50  
3rd speed rpm : 780  
travel mm : 6.10...6.60  
4th speed rpm : 1010  
travel mm : 8.30...8.80  
5th speed rpm : 1092  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1050  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 256.0...258.0  
1000 : (253.0...261.0)  
Sread cm3 : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 15.00  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1200  
Speed rpm : 0.00...1.40

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack trave: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40

CONSTANT REGULATION

Speed rpm : 300...400

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 700  
Rack travel in m: 13.90..14.10  
3rd pressure hPa : 1100  
Rack travel in m: 15.10...15.20  
4th pressure hPa : 1400  
Rack travel in m: 15.70...15.90  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 950  
Del.quantity cm3/ : 279.0...282.0  
1000 s: (276.0...285.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del.quantity cm3/ : 286.0...290.0  
1000 s: (283.0...286.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.00  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 908X  
  
Injection pump  
Pump designation : PE8P120A320LS7838-10  
EP type number : 0 412 628 854  
Governor  
Governor design. : RQV300...950PA797-23  
Governor no. : 0 421 813 910

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 320.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 23.5...23.7

100 s: (23.2...24.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.4...5.8

Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.00...1.50

2nd speed rpm : 617  
travel mm : 5.00...5.50

3rd speed rpm : 780  
travel mm : 6.10...6.60

4th speed rpm : 1009  
travel mm : 8.30...8.80

5th speed rpm : 1092  
travel mm : 9.80...10.30

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1020

Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 1200  
Del.quantity : 235.0...237.0  
1000 : (232.0...240.0)  
Spread cm3 : 6.00  
1000 : (9.00)

RATED SPEED

1st version  
Control lever  
position degrees: 120...128

Testing:

1st rack travel in: 13.20  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 950  
Rack travel in m: 14.20...14.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 550

F07

Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 240 (260)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 950  
Del.quantity cm3/ : 230.0...234.0  
1000 s: (227.0...237.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 220.0...240.0  
1000 s: (216.0...244.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 08.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 911  
  
Injection pump  
Pump designation : PE8P120A320LS7839-10  
EP type number : 0 412 628 855  
Governor  
Governor design. : RGV300...1050PA797  
-27  
Governor no. : 0 421 813 916

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300

travel mm : 1.00...1.50

2nd speed rpm : 558

travel mm : 4.30...4.80

3rd speed rpm : 820

travel mm : 5.90...6.40

4th speed rpm : 1108

travel mm : 8.30...8.80

5th speed rpm : 1183

travel mm : 8.30...8.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1130

Rack travel in mm : 15.20...17.80

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 600  
Aneroid pressure h: 900  
Del.quantity : 256.0...258.0  
1000 : (253.0...261.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 118...126

### Testing:

1st rack travel in: 15.20  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1175...1205  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

### LOW IDLE 1

Control lever  
position degrees: 76...84

### Testing:

Speed rpm : 200  
Minimum rack trave: 6.80  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40

## CONSTANT REGULATION

Speed rpm : 300...450

## TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 16.20...16.40  
3rd speed rpm : 800  
Rack travel in m: 16.40...16.60

Aneroid/Altitude  
Compensator Test

### 1st version

#### Setting

Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.90...15.10

### Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 700

F09

Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1100  
Rack travel in m: 15.10...15.20

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 2000  
Speed rpm : 1050  
Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del.quantity cm3/ : 276.0...280.0  
1000 s: (273.0...283.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 15.20  
Speed rpm : 1090...1100

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 08.92  
Test oil : ISO-4113

Combination no. : 0 402 648 917

Injection pump  
Pump designation : PE8P120A320LS7839-10  
EP type number : 0 412 628 855  
Governor  
Governor design. : RQ300/1050PA993-3  
Governor no. : 0 421 801 601

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.20  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 7.20  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?  
2nd speed rpm : 1050  
Rack travel in m: 16.20...16.40  
3rd speed rpm : 800  
Rack travel in m: 16.40...16.60

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 700  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1100  
Rack travel in m: 15.10...15.20  
4th pressure hPa : 1400  
Rack travel in m: 15.70...15.90  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 1050  
Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del.quantity cm3/ : 276.0...280.0  
1000 s: (273.0...283.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 15.20  
Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 03.12.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 918X  
 Injection pump  
 Pump designation : PE8P120A320LS7838-10  
 EP type number : 0 412 628 854  
 Governor  
 Governor design. : RQ300/1050PA993-4  
 Governor no. : 0 421 801 602  
 Cust. part no. : 021074102  
 Customer-spec. information  
 Customer : MERCEDES-BENZ  
 Engine : OM442 LA  
 1st version kW : 320.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve  
 : 1 417 413 025  
 Inlet press., bar : 1.50  
 Overflow  
 quantity min. 1/h: 100...120  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 075  
 Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 23.7...23.9  
 100 s: (23.4...24.2)

Spread cm3 : 0.6  
 100 s: (0.9)

2nd speed rpm : 300.0  
 Rack travel in mm : 6.2...6.8  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 1020  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1200  
 Del.quantity : 237.0...239.0  
 1000 : (234.0...242.0)  
 Spread cm3 : 6.00  
 1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 1020  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 13.20  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.80  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 300...500

TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 1050  
Rack travel in m: 14.20...14.40

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 8.90...9.20

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 9.70...9.80  
2nd pressure hPa : 600  
Rack travel in m: 13.80...14.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

F13

1st version

Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 222.0...226.0  
1000 s: (219.0...229.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...134.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.20  
Speed rpm : 1090...1105

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 06.92  
Test oil : ISO-4113

Combination no. : 0 402 648 921

Injection pump  
Pump designation : PE8P12DA320LS7839-10  
EP type number : 0 412 628 855  
Governor  
Governor design. : RQ300/950PA993-8  
Governor no. : 0 421 801 618

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 370.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
: (4.95...5.15)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.90...15.10

Del.quantity cm3/ : 25.6...25.8

100 s: (25.3...26.1)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.6

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 256.0...258.0

1000 : (253.0...261.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 15.30  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1075...1105  
4th rack travel in: 1150  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.3

Testing:

Speed rpm : 200  
Minimum rack travel: 7.60  
Speed rpm : 300  
Rack travel in mm : 6.20...6.40  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 14.90...15.10

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 700  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1100  
Rack travel in m: 15.10...15.20  
4th pressure hPa : 1400  
Rack travel in m: 15.70...15.90  
5th pressure hPa : -  
Rack travel in m: 9.10...9.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 2000  
Speed rpm : 950  
Del.quantity cm3/ : 279.0...282.0  
1000 s: (276.0...285.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 2000  
Speed rpm : 800  
Del.quantity cm3/ : 286.0...290.0  
1000 s: (283.0...293.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 15.30  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 260.0...280.0  
1000 s: (256.0...284.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 14,7 u 4  
Edition : 23.10.92  
Replaces : 04.92  
Test oil : ISO-4113

Combination no. : 0 402 648 926

Injection pump  
Pump designation : PE8P120A320LS7840  
EP type number : 0 412 628 850  
Governor  
Governor design. : RQ300/1050PA972-9  
Governor no. : 0 421 801 632

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)  
Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600  
Rack travel in mm : 12.70...12.90  
Del.quantity cm3/ : 19.1...19.3  
100 s: (18.8...19.6)  
Spread cm3 : 0.6  
100 s: (0.9)

2nd speed rpm : 600.0  
Rack travel in mm : 4.2...4.8  
Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 700  
Del.quantity : 191.0...193.0  
1000 : (188.0...196.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1250  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 7.90  
Speed rpm : 300  
Rack travel in mm : 6.20...6.80  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 600  
Pressure hPa : 700  
Rack travel mm : 12.70...12.90

Measurement

Speed 1/min : 600

1st pressure hPa : 250  
Rack travel in m: 11.10...11.30  
2nd pressure hPa : 440  
Rack travel in m: 12.40...12.60  
3rd pressure hPa : 900  
Rack travel in m: 12.90...13.10  
4th pressure hPa : -  
Rack travel in m: 10.70...11.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1300  
Speed rpm : 1050  
Del.quantity cm3/ : 210.0...213.0  
1000 s: (207.0...216.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1300  
Speed rpm : 800  
Del.quantity cm3/ : 212.0...216.0  
1000 s: (209.0...219.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.50  
Speed rpm : 1090...1105

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 08.92  
Test oil : ISO-4113

Combination no. : 0 402 648 933

Injection pump  
Pump designation : PE8P120A320LS7847  
EP type number : 0 412 628 863  
Governor  
Governor design. : RQ300/950PA1031-3  
Governor no. : 0 421 801 646

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.50...13.60

Del.quantity cm3/ : 23.3...23.5

100 s: (23.0...23.8)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 5.2...5.8  
Del.quantity cm3/ : 1.0...1.6  
100 s: (0.7...1.9)

Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2

Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 1200  
Del.quantity : 233.0...235.0  
1000 : (230.0...238.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version

Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.00

Speed rpm : 990...1005

2nd rack travel in: 4.00

Speed rpm : 1060...1090

4th rack travel in: 1350

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.5

Testing:

Speed rpm : 200

Minimum rack travel: 7.90

Speed rpm : 300

Rack travel in mm : 5.40...5.60

Rack travel in mm : 2.00

Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : 0.55

Torque control curve - 1st version

1st speed rpm : 950

Rack travel in m: 12.90...13.10

2nd speed rpm : 800

Rack travel in m: 13.90...14.10

3rd speed rpm : 700

Rack travel in m: 14.50...14.70

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 10.50...10.70

Measurement

Speed 1/min : 500

1st pressure hPa : 300

Rack travel in m: 11.10...11.20

2nd pressure hPa : 650

Rack travel in m: 12.60...12.80

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 950

Del.quantity cm3/ : 214.0...218.0

1000 s: (211.0...221.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 134.0...136.0

1000 s: (131.0...139.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 260.0...280.0

1000 s: (256.0...284.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 08.92  
Test oil : ISO-4113

Combination no. : 0 402 648 941

Injection pump  
Pump designation : PE8P120A32JLS7847  
EP type number : 0 412 628 863  
Governor  
Governor design. : RQV300...950PA1033-7  
Governor no. : 0 421 814 019

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 95...115

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.30...13.40

Del.quantity cm3/ : 22.8...23.0

100 s: (22.5...23.3)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 5.2...5.8

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.0)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 1.10...1.50

2nd speed rpm : 567  
travel mm : 4.40...5.00

3rd speed rpm : 780  
travel mm : 6.00...6.60

4th speed rpm : 1010  
travel mm : 8.50...8.70

5th speed rpm : 1190  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1050

Rack travel in mm : 10.70...13.30

FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600  
Aneroid pressure h: 1200  
Del.quantity : 228.0...230.0  
1000 : (225.0...233.0)  
Spread cm3 : 6.00  
1000 : (9.00)

RATED SPEED

1st version

Control lever  
position degrees: 117...125

Testing:

1st rack travel in: 12.00  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1

Control lever  
position degrees: 82...90

Testing:

Speed rpm : 200  
Minimum rack travel: 9.00  
Speed rpm : 300  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 300...390

TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 13.40...13.60  
2nd speed rpm : 950  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 850  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.40...10.70

Measurement

Speed 1/min : 500

1st pressure hPa : 350

F21

Rack travel in m: 11.10...11.20  
2nd pressure hPa : 750  
Rack travel in m: 12.80...13.00

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 950  
Del.quantity cm3/ : 214.0...218.0  
1000 s: (211.0...221.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 990...1000

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 275.0...295.0  
1000 s: (271.0...299.0)

Remarks:

:

## Note remarks

Combination no. : 0 402 648 945

Customer-spec. information  
Customer : MERCEDES-BENZ

1st version kW : 280.0  
Rated speed : 2100

Test oil  
inlet temp. °C : 38...42

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Test pressure, bar: 25...27

```
Prestroke mm      : 5.50...5.60
                   : (5.45...5.65)
Rack travel in mm : 20.00...21.00
Firing order      : 8- 7- 2- 6- 3- 5-
                   : 4- 1
```

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

1st speed      rpm : 550

Rack travel in mm : 13.00...13.10

Del.quantity cm<sup>3</sup>/ : 22.5...22.7

100 s: (22.2...23.0)

Spread            cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

1st version

Speed rpm : 550

Aneroid pressure h: 1200

Del.quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.60

Speed rpm : 1090...1105

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1300

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.2

Testing:

Speed rpm : 200

Minimum rack travel: 7.30

Speed rpm : 300

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

Speed rpm : 355...395

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 550

Rack travel in m: 13.00...13.10

2nd speed rpm : 1050

Rack travel in m: 12.60...12.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : 350

Rack travel in m: 10.70...10.80

2nd pressure hPa : 700

Rack travel in m: 12.20...12.40

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 1050

Del.quantity cm3/ : 210.0...214.0

1000 s: (207.0...217.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 134.0...136.0

1000 s: (131.0...139.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.60

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 45.0...75.0

1000 s: (41.0...79.0)

Rack travel in mm : 10.10...10.50

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 09.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 946  
  
Injection pump  
Pump designation : PE8P120A320LS7847  
EP type number : 0 412 628 863  
Governor  
Governor design. : RQ300/1050PA1031-7  
Governor no. : 0 421 801 667

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
(5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## EASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1200

Del.quantity : 225.0...227.0

1000 : (222.0...230.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.70

Speed rpm : 1090...1105

2nd rack travel in: 4.00

Speed rpm : 1175...1205

4th rack travel in: 13.00

Speed rpm : 0.00...1.40

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.2

Testing:

Speed rpm : 200

Minimum rack travel: 7.40

Speed rpm : 300

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

Speed rpm : 365...405

TORQUE CONTROL

Dimension a mm : 0.30

Torque control curve - 1st version

1st speed rpm : 550

Rack travel in m: 13.00...13.10

2nd speed rpm : 1050

Rack travel in m: 12.60...12.80

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 10.10...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : 350

Rack travel in m: 10.70...10.80

2nd pressure hPa : 700

Rack travel in m: 12.30...12.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

Speed rpm : 1050

Del.quantity cm3/ : 210.0...214.0

1000 s: (207.0...217.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 134.0...136.0

1000 s: (131.0...139.0)

Spread cm3 : 8.00

1000 s: (12.0)

EREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 275.0...295.0

1000 s: (271.0...299.0)

Remarks:

:

APPLICATION

Omnibus

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 09.92  
Test oil : ISO-4113

Combination no. : 0 402 648 947

Injection pump  
Pump designation : PE8P120A320LS7859  
EP type number : 0 412 628 869  
Governor  
Governor design. : RQ300/950PA1032-5  
Governor no. : 0 421 801 668

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 550

Aneroid pressure h: 1000

Del.quantity : 241.0...243.0

1000 : (238.0...246.0)

Spread cm<sup>3</sup> : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.60  
Speed rpm : 990...1005  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.2

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 360...400

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 550  
Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm<sup>3</sup>/ : 230.0...234.0  
1000 s: (227.0...237.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

F27

1st version

1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 990...1005

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 65.0...95.0  
1000 s: (61.0...99.0)  
Rack travel in mm : 9.40...9.80

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : 09.92  
Test oil : ISO-4113

Combination no. : 0 402 648 948

Injection pump  
Pump designation : PE8P120A320LS7859  
EP type number : 0 412 628 869  
Governor  
Governor design. : RQ300/1050PA1030-7  
Governor no. : 0 421 801 669

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...40

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.60...13.70

Del. quantity cm3/ : 24.1...24.3  
100 s: (23.8...24.6)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 300.0  
Rack travel in mm : 4.9...5.5  
Del. quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h: 1000  
Del. quantity : 241.0...243.0  
1000 : (238.0...246.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.40

Speed rpm : 1090...1105

2nd rack travel in: 4.00

Speed rpm : 1170...1200

4th rack travel in: 1300

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.2

Testing:

Speed rpm : 200

Minimum rack travel: 8.00

Speed rpm : 300

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

Speed rpm : 360...400

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 550

Rack travel in m: 14.30...14.50

2nd speed rpm : 1050

Rack travel in m: 13.30...13.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 250

Rack travel in m: 10.30...10.40

2nd pressure hPa : 550

Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1050

Del.quantity cm3/ : 222.0...226.0

1000 s: (219.0...229.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

GO1

Speed rpm : 500

Del.quantity cm3/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40

Speed rpm : 1090...1105

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 65.0...95.0

1000 s: (61.0...99.0)

Rack travel in mm : 9.40...9.80

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 27.11.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 950  
 Injection pump  
 Pump designation : PE8P120A320LS7860  
 EP type number : 0 412 628 870  
 Governor  
 Governor design. : RQV300...1050PA1052  
 Governor no. : 0 421 814 037

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402 LA

1st version kW : 280.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 13.40...13.50  
 Del.quantity cm3/ : 23.3...23.5  
 100 s: (23.0...23.8)  
 Spread cm3 : 0.6  
 100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.1...5.7  
 Del.quantity cm3/ : 1.0...1.6  
 100 s: (0.7...1.9)  
 Spread cm3 : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.00...1.50  
 2nd speed rpm : 403  
 travel mm : 1.70...2.20  
 3rd speed rpm : 453  
 travel mm : 2.30...2.80  
 4th speed rpm : 770  
 travel mm : 4.70...5.20  
 5th speed rpm : 1108  
 travel mm : 9.40...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1175  
 Rack travel in mm : 10.60...13.20

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700

Aneroid pressure h: 1200  
Del.quantity : 233.0...235.0  
1000 : (230.0...238.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 11.90  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1350  
Speed rpm : 0.00...1.50

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 250  
Minimum rack travel: 9.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

CONSTANT REGULATION  
Speed rpm : 380...500

TORQUE CONTROL  
Dimension a mm : 0.60  
Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 13.40...13.50  
2nd speed rpm : 1050  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 900  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.40...10.70

Measurement  
Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.00...11.10  
2nd pressure hPa : 750  
Rack travel in m: 12.70...12.90

#### START CUT-OUT

Speed 1/min : 270 (280)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1050  
Del.quantity cm3/ : 206.0...210.0  
1000 s: (203.0...213.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 11.90  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 951

Injection pump  
Pump designation : PE8P120A320LS7840-1  
EP type number : 0 412 628 862  
Governor  
Governor design. : RQV300...1050PA1053  
Governor no. : 0 421 814 038

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 A

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 700  
Rack travel in mm : 13.30...13.40  
Del. quantity cm3/ : 20.9...21.1  
100 s: (20.6...21.4)  
Spread cm3 : 0.6  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.9...6.5  
Del. quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.00...1.50  
2nd speed rpm : 453  
travel mm : 2.30...2.80  
3rd speed rpm : 770  
travel mm : 4.70...5.20  
4th speed rpm : 1108  
travel mm : 9.40...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1180  
Rack travel in mm : 10.40...13.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Aneroid pressure h: 1200

Del.quantity : 209.0...211.0  
1000 : (206.0...214.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 79...87

Testing:  
1st rack travel in: 11.60  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 79...87

Testing:  
Speed rpm : 250  
Minimum rack travel: 9.90  
Speed rpm : 350  
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION  
Speed rpm : 380...550

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 700  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 1030  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 825  
Rack travel in m: 13.10...13.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 700  
Rack travel in m: 12.60...12.80

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1030  
Del.quantity cm3/ : 192.0...196.0  
1000 s: (189.0...199.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.60  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 648 952

Injection pump  
Pump designation : PE8P120A320LS7856  
EP type number : 0 412 628 867  
Governor  
Governor design. : RQV350...1050PA1051  
-1  
Governor no. : 0 421 814 039

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

G06

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
Phasing : 270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.00...14.10

Del. quantity cm<sup>3</sup>/ : 23.8...24.0  
100 s: (23.5...24.3)

Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.9...6.5  
Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.00...1.50  
2nd speed rpm : 453  
travel mm : 2.30...2.80  
3rd speed rpm : 770  
travel mm : 4.70...5.20  
4th speed rpm : 1108  
travel mm : 9.40...9.90

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1170  
Rack travel in mm : 11.50...14.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 600  
Aneroid pressure h: 1000

Del.quantity : 238.0...240.0  
1000 : (235.0...243.0)  
Spread cm3 : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 99...107

Testing:  
1st rack travel in: 12.80  
Speed rpm : 1080...1090  
2nd rack travel in: 4.00  
Speed rpm : 1145...1175  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 250  
Minimum rack travel: 9.40  
Speed rpm : 350  
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION  
Speed rpm : 350...450

TORQUE CONTROL  
Dimension a mm : 0.20  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 14.00...14.10  
2nd speed rpm : 1050  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 960  
Rack travel in m: 13.80...13.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.60...10.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 600  
Rack travel in m: 12.90...13.10

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm3/ : 222.0...226.0  
1000 s: (219.0...229.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 142.0...144.0  
1000 s: (139.0...147.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack travel: 12.80  
Speed rpm : 1080...1090

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 27.11.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 648 953  
 Injection pump  
 Pump designation : PE8P12JA320LS7859  
 EP type number : 0 412 628 869  
 Governor  
 Governor design. : RQV300...950PA1033  
 -10  
 Governor no. : 0 421 814 040

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
 Rated speed : 1900

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 550

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 24.1...24.3

100 s: (23.8...24.6)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 4.9...5.5

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.6

100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
 travel mm : 1.00...1.50

2nd speed rpm : 567  
 travel mm : 4.40...4.90

3rd speed rpm : 617  
 travel mm : 5.00...5.50

4th speed rpm : 780  
 travel mm : 6.10...6.60

5th speed rpm : 1009  
 travel mm : 8.30...8.80

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1

Speed rpm : 1050

Rack travel in mm : 11.30...13.90

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 550  
Aneroid pressure h: 1000  
Del.quantity : 241.0...243.0  
1000 : (238.0...246.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 117...125

### Testing:

1st rack travel in: 12.60  
Speed rpm : 990...1000  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.50

## LOW IDLE 1

Control lever  
position degrees: 82...90

### Testing:

Speed rpm : 200  
Minimum rack travel: 8.80  
Speed rpm : 300  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 380...420

Aneroid/Altitude  
Compensator Test

## 1st version

### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.40...9.70

## Measurement

Speed 1/min : 500

1st pressure hPa : 250  
Rack travel in m: 10.30...10.40  
2nd pressure hPa : 550  
Rack travel in m: 12.30...12.50

## START CUT-OUT

Speed 1/min : 220 (240)

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1000  
Speed rpm : 950  
Del.quantity cm3/ : 230.0...234.0  
1000 s: (227.0...237.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 132.0...134.0  
1000 s: (129.0...137.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 990...1000

## STARTING FUEL DELIVERY

Speed rpm : 100  
Rack travel in mm : 9.40...9.80

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 648 954  
  
Injection pump  
Pump designation : PE8P120A320LS7859  
EP type number : 0 412 628 869  
Governor  
Governor design. : RQ300/1050PA1031-8  
Governor no. : 0 421 801 674

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442 LA

1st version kW : 320.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 550  

---

Rack travel in mm : 13.60...13.70  

---

Del. quantity cm<sup>3</sup>/ : 24.1...24.3  

---

100 s: (23.8...24.6)  

---

Spread cm<sup>3</sup> : 0.6  

---

100 s: (0.9)  

---

2nd speed rpm : 300.0  
Rack travel in mm : 4.9...5.5  
Del. quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.6  
100 s: (1.0)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 550  
Aneroid pressure h: 1000  
Del. quantity : 241.0...243.0  
1000 : (238.0...246.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
  
Setting point:  
Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.40  
Speed rpm : 1090...1105

2nd rack travel in: 4.00  
Speed rpm : 1165...1195

4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 5.2

Testing:

Speed rpm : 200

Minimum rack travel: 7.40

Speed rpm : 300

Rack travel in mm : 5.10...5.30

Rack travel in mm : 2.00

Speed rpm : 370...410

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 550

Rack travel in m: 14.30...14.50

2nd speed rpm : 1050

Rack travel in m: 13.30...13.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500

Pressure hPa : -

Rack travel mm : 9.40...9.70

Measurement

Speed 1/min : 500

1st pressure hPa : 250

Rack travel in m: 10.30...10.40

2nd pressure hPa : 550

Rack travel in m: 12.30...12.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

Speed rpm : 1050

Del.quantity cm3/ : 222.0...226.0

1000 s: (219.0...229.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 132.0...134.0

1000 s: (129.0...137.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.40

Speed rpm : 1090...1105

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 23.10.92  
Replaces : 07.92  
Test oil : ISO-4113

Combination no. : 0 402 649 816

Injection pump  
Pump designation : PE10P120A520LS7853  
EP type number : 0 412 629 810  
Governor  
Governor design. : RQV300...1150PA1039-2K  
Governor no. : 0 421 815 316

Customer-spec. information  
Customer : MAN

Engine : D 2840 LXE

1st version kW : 603.0  
Rated speed : 2300

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
                  : (4.45...4.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 10- 9- 4- 1- 8- 7-  
                  6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
Phasing : 216-261-288-333  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 1150  
Rack travel in mm : 13.30...13.40  
Del.quantity cm3/ : 29.4...29.6  
100 s : (29.1...29.9)  
Spread cm3 : 0.5  
100 s : (0.9)

2nd speed rpm : 700  
Rack travel in mm : 12.10...12.30  
Del.quantity cm3/ : 25.2...25.8  
100 s : (24.9...26.1)  
Spread cm3 : 1.0  
100 s : (1.4)  
3rd speed rpm : 300  
Rack travel in mm : 6.70...6.90  
Del.quantity cm3/ : 4.0...5.0 \*\*  
100 s : (-)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 300  
travel mm : 2.00...2.20  
2nd speed rpm : 450  
travel mm : 4.00...4.40  
3rd speed rpm : 800  
travel mm : 6.70...7.10  
4th speed rpm : 1200  
travel mm : 10.30...10.50  
5th speed rpm : 1400  
travel mm : 13.00...14.00

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -1  
Speed rpm : 1280  
Rack travel in mm : 11.20...13.80

# FULL LOAD DELIV. AT FULL LOAD STOP

## 1st version

Speed rpm : 1150  
Aneroid pressure h: 1300  
Del.quantity : 294.0...296.0  
1000 : (291.0...299.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

## RATED SPEED

### 1st version

Control lever  
position degrees: 117...125

### Testing:

1st rack travel in: 12.30  
Speed rpm : 1195...1210  
2nd rack travel in: 4.00  
Speed rpm : 1310...1340  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 72...80

### Testing:

Speed rpm : 200  
Minimum rack trave: 8.20  
Speed rpm : 300  
Rack travel in mm : 6.70...6.90

## CONSTANT REGULATION

Speed rpm : 280...410

## TORQUE CONTROL

Dimension a mm : 1.20  
Torque control curve - 1st version  
1st speed rpm : 1150  
Rack travel in m: 13.30...13.40  
2nd speed rpm : 700  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 900  
Rack travel in m: 12.90...13.10

Aneroid/Altitude  
Compensator Test

## 1st version

### Setting

Speed rpm : 1150  
Pressure hPa : 1300  
Rack travel mm : 13.30...13.40

### Measurement

Speed 1/min : 1150

1st pressure hPa : -  
Rack travel in m: 9.90...10.10  
2nd pressure hPa : 400  
Rack travel in m: 10.30...10.40  
3rd pressure hPa : 850  
Rack travel in m: 12.40...12.70

## START CUT-OUT

Speed 1/min : 240 (260)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1300  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 252.0...258.0  
1000 s: (249.0...261.0)  
Spread cm<sup>3</sup> : 10.00  
1000 s: (14.0)  
Aneroid pressure h: 1300  
Speed rpm : 900  
Del.quantity cm<sup>3</sup>/ : 277.0...283.0  
1000 s: (274.0...286.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 169.0...171.0  
1000 s: (166.0...174.0)

## BREAKAWAY

### 1st version

1mm rack travel less than

full load rack tr: 12.30  
Speed rpm : 1195...1210

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...120.0\*\*  
1000 s: (-)

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 0 \*  
1000 s: (-)  
Rack travel in mm : 18.2...21.0

## HIGH IDLE

### 1st version

Speed rpm : 500  
Rack travel in mm : 0.00...7.00  
Del.quantity cm<sup>3</sup>/ : 0 \*  
1000 s: (-)

2nd version

Speed rpm : 500  
Rack travel in mm : 0.00...7.50  
Del.quantity cm<sup>3</sup>/ : 0...50.0 \*  
1000 s: (-)

3rd version

Speed rpm : 500  
Rack travel in mm : 8.50...8.70  
Del.quantity cm<sup>3</sup>/ : 125.0...  
1000 s: (-)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.70...6.90  
Del.quantity cm<sup>3</sup>/ : 40.0...50.0  
1000 s: (-)

Remarks:

\* applies to cylinders 1, 2, 3, 7 and 9  
\*\* applies for cylinders 4, 5, 6, 8 and 10

APPLICATION

Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 27.11.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 402 649 817  
 Injection pump  
 Pump designation : PE10P120A320LS7862  
 EP type number : 0 412 629 811  
 Governor  
 Governor design. : RQV350...1050PA1048  
 Governor no. : 0 421 814 031

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM443 LA

1st version kW : 412.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 10- 9- 4- 1- 8- 7  
 - 6- 3- 5- 2

Phasing : 0-45-72-117-144-189-  
 216-261-288-333  
 Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 10

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 13.80...13.90

Del.quantity cm3/ : 23.0...23.2

100 s: (22.7...23.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0  
 Rack travel in mm : 4.9...5.5  
 Del.quantity cm3/ : 1.6...2.2  
 100 s: (1.3...2.5)  
 Spread cm3 : 0.6  
 100 s: (1.0)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 1.30...1.80  
 2nd speed rpm : 404  
 travel mm : 2.25...2.75  
 3rd speed rpm : 570  
 travel mm : 3.30...3.80  
 4th speed rpm : 900  
 travel mm : 5.40...5.90  
 5th speed rpm : 1107  
 travel mm : 7.80...8.30

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -1  
 Speed rpm : 1145  
 Rack travel in mm : 12.20...14.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050

Aneroid pressure h: 1300  
Del.quantity : 230.0...232.0  
1000 : (227.0...235.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 117...125

Testing:  
1st rack travel in: 12.80  
Speed rpm : 1090...1100  
2nd rack travel in: 4.00  
Speed rpm : 1160...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 65...73

Testing:  
Speed rpm : 250  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 350...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 400  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 600  
Rack travel in m: 12.30...12.40

#### START CUT-OUT

Speed 1/min : 270 (290)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1300

Speed rpm : 800  
Del.quantity cm3/ : 228.0...232.0  
1000 s: (225.0...235.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1300  
Speed rpm : 1050  
Del.quantity cm3/ : 168.0...170.0 \*  
1000 s: (165.0...173.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm3 : 8.00  
1000 s: (-)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1090...1100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 250.0...270.0  
1000 s: (246.0...274.0)

Remarks:

:

\* = Set at reduced-delivery stop.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 402 670 800  
  
Injection pump  
Pump designation : PE12P120A320LS7850  
EP type number : 0 412 620 833  
Governor  
Governor design. : RSV350...750POA825  
Governor no. : 0 421 833 221

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 444 LA

1st version kW : 389.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 150...170

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
x Wall thickness : 6.00X1.50X1000  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
                  : (5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 12- 1- 5- 9- 8- 3-  
                  4- 11- 10- 2- 6- 7

Phasing : 0-45-60-105-120-165-  
                  180-225-240-285-300-  
                  345

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 12

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.10...13.20

Del.quantity cm<sup>3</sup>/ : 21.0...21.2

100 s: (20.7...21.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.6...4.8

Del.quantity cm<sup>3</sup>/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 210.0...212.0

1000 : (207.0...215.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 21...29

Testing:

1st rack travel in: 12.10  
Speed rpm : 750...755  
2nd rack travel in: 4.00  
Speed rpm : 780...790  
4th rack travel in: 1000  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 9...17  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 4.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.60...4.80

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 209.0...213.0  
1000 s: (206.0...216.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.10  
Speed rpm : 750...755

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 210.0...230.0  
1000 s: (206.0...234.0)

Remarks:

:

Observe VDT-I-420/120

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 676 814  
Injection pump  
Pump designation : PE6P120A320LS7861  
EP type number : 0 412 626 876  
Governor  
Governor design. : RSV350...1050POA535  
-7  
Governor no. : 0 421 833 386

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 401 LA

1st version kW : 213.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 20.5...20.7

100 s: (20.2...21.0)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 4.8...5.4

Del.quantity cm3/ : 1.0...1.6

100 s: (0.7...1.9)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1030

Aneroid pressure h: 1200

Del.quantity : 205.0...207.0

1000 : (202.0...210.0)

Spread cm3 : 6.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 95...103

Testing:

1st rack travel in: 11.40  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1145...1163  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.80...5.40  
Rack travel in mm : 2.00  
Speed rpm : 370...430

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.50

Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 10.90...11.00  
2nd pressure hPa : 450  
Rack travel in m: 11.40...11.60

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 202.0...206.0  
1000 s: (199.0...209.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 130.0...132.0  
1000 s: (127.0...135.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 230.0...250.0  
1000 s: (226.0...254.0)

Remarks:

Observe VDT-I-420/120

APPLICATION

Sweeping machine

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 30.10.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 676 815

Injection pump  
Pump designation : PE6P120A320LS7808-3  
EP type number : 0 412 626 870  
Governor  
Governor design. : RSV500...900POA535-8  
Governor no. : 0 421 833 387

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 441 LA

1st version kW : 236.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 3- 5- 2- 4- 1

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 880

Rack travel in mm : 14.70...14.80

Del.quantity cm<sup>3</sup>/ : 23.3...23.5  
100 s: (23.0...23.8)

Spread cm<sup>3</sup> : 0.6  
100 s: (0.9)

2nd speed rpm : 500.0  
Rack travel in mm : 4.3...4.9  
Del.quantity cm<sup>3</sup>/ : 1.6...2.2  
100 s: (1.3...2.5)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 880  
Aneroid pressure h: 1200  
Del.quantity : 233.0...235.0  
1000 : (230.0...238.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 81...89

Testing:

1st rack travel in: 13.70  
Speed rpm : 930...940  
2nd rack travel in: 4.00  
Speed rpm : 970...988  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 4.6

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 500  
Rack travel in mm : 4.30...4.90  
Rack travel in mm : 2.00  
Speed rpm : 500...560

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.60...9.90

Measurement

Speed 1/min : 500

1st pressure hPa : 400  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 600  
Rack travel in m: 12.80...13.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm<sup>3</sup>/ : 145.0...147.0  
1000 s: (142.0...150.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 930...940

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:  
: ATLAS-COPCO

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 08.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 678 816  
  
Injection pump  
Pump designation : PE8P120A320LS7857  
EP type number : 0 412 628 866  
Governor  
Governor design. : RSV550...1050POA826  
-3  
Governor no. : 0 421 833 382

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442LA

1st version kW : 370.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY Test pressure, bar: 25...27

Prestroke mm : 5.00...5.10  
                  : (4.95...5.15)  
Rack travel in mm : 19.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
                  4- 1

Phasing : 0-45-90-135-180-225-  
                  270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1080

Rack travel in mm : 13.50...13.60

Del.quantity cm<sup>3</sup>/ : 25.9...26.1

100 s: (25.6...26.4)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 550.0

Rack travel in mm : 3.5...4.1

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1080

Del.quantity : 259.0...261.0

1000 : (256.0...264.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Control lever  
position degrees: 86...94

Testing:

1st rack travel in: 12.50  
Speed rpm : 1110...1120  
2nd rack travel in: 4.00  
Speed rpm : 1140...1158  
4th rack travel in: 1500  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 3.8

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 550  
Rack travel in mm : 3.70...3.90  
Rack travel in mm : 2.00  
Speed rpm : 550...610

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1080  
Rack travel in m: 13.50...13.60  
2nd speed rpm : 1000  
Rack travel in m: 13.60...13.80  
3rd speed rpm : 600  
Rack travel in m: 14.00...14.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 290.0...294.0  
1000 s: (287.0...297.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.50  
Speed rpm : 1110...1120

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 325.0...345.0  
1000 s: (321.0...349.0)

Remarks:

:

In order to adjust and test the EP combination, set full-load speed regul. at 1110...1120 1/min. Then set speed regul. to 1060...1070 1/min again.

APPLICATION

Forage harvester

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 27.11.92  
 Replaces : --  
 Test oil : ISO-4113

Combination no. : 0 402 678 819

Injection pump  
 Pump designation : PE8P120A320LS7860  
 EP type number : 0 412 628 870  
 Governor  
 Governor design. : RSV550...1050POA826  
 -5  
 Governor no. : 0 421 833 390

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM402LA

1st version kW : 280.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 110...130

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.50...5.60  
 : (5.45...5.65)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 8- 7- 2- 6- 3- 5-  
 4- 1

Phasing : 0-45-90-135-180-225-  
 270-315  
 Tolerance + - ° : 0.50 (0.75)  
 Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1050

---

Rack travel in mm : 12.20...12.30

---

Del.quantity cm3/ : 20.7...20.9  
 100 s: (20.4...21.2)

---

Spread cm3 : 0.5  
 100 s: (0.9)

---

2nd speed rpm : 550.0  
 Rack travel in mm : 3.3...3.9  
 Del.quantity cm3/ : 1.5...2.1  
 100 s: (1.2...2.4)  
 Spread cm3 : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1050  
 Del.quantity : 207.0...209.0  
 1000 : (204.0...212.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 87...95

### Testing:

1st rack travel in: 11.20  
Speed rpm : 1110...1120  
2nd rack travel in: 4.00  
Speed rpm : 1140...1158  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 3.6

### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 550  
Rack travel in mm : 3.50...3.70  
Rack travel in mm : 2.00  
Speed rpm : 540...600

### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1050  
Rack travel in m: 12.20...12.30  
2nd speed rpm : 700  
Rack travel in m: 12.80...13.00  
3rd speed rpm : 900  
Rack travel in m: 12.50...12.70

### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Speed rpm : 700  
Del.quantity cm<sup>3</sup>/ : 232.0...236.0  
1000 s: (229.0...239.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.20  
Speed rpm : 1110...1120

### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 240.0...260.0  
1000 s: (236.0...264.0)

### Remarks:

In order to adjust and test the EP combination, set full-load speed regul. at 1110...1120 1/min. Then set speed regul. to 1060...1070 1/min again.

### APPLICATION

Forage harvester

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 678 820

Injection pump  
Pump designation : PE8P120A32OLS7823-1  
EP type number : 0 412 628 872  
Governor  
Governor design. : RSV350...1050POA535  
-9  
Governor no. : 0 421 833 393

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM442LA

1st version kW : 362.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness : 8.00X2.50X1000  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
(5.15...5.35)  
Rack travel in mm : 9.00...12.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
270-315

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.70...13.80

Del.quantity cm3/ : 23.4...23.7

100 s: (23.1...24.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.4...6.0

Del.quantity cm3/ : 1.5...2.1

100 s: (1.2...2.4)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...0.70

Governor spring pre-tension

Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 900

Del.quantity : 234.0...237.0

1000 : (231.0...240.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: ?

Testing:

1st rack travel in: 13.50  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1135...1153  
4th rack travel in: 1400  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 63...71  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 360...420

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 14.50...14.70  
2nd speed rpm : 950  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 700  
Rack travel in m: 15.40...15.50

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 600  
Pressure hPa : 900  
Rack travel mm : 13.70...13.80

Measurement

Speed 1/min : 600

1st pressure hPa : 350  
Rack travel in m: 11.20...11.40  
2nd pressure hPa : 1050  
Rack travel in m: 13.80...14.00 \*  
3rd pressure hPa : -  
Rack travel in m: 9.70...10.00

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1600  
Speed rpm : 1030  
Del.quantity cm3/ : 253.0...256.0  
1000 s: (250.0...259.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1600  
Speed rpm : 800  
Del.quantity cm3/ : 271.0...274.0  
1000 s: (268.0...277.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 141.0...143.0  
1000 s: (138.0...146.0)  
Spread cm3 : 8.00  
1000 s: (-)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 240.0...260.0  
1000 s: (236.0...264.0)

Remarks:

:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 678 821

Injection pump  
Pump designation : PE8P120A320LS7860-1  
EP type number : 0 412 628 871  
Governor  
Governor design. : RSV350...1050POA535  
-11

Governer no. : 0 421 833 391

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 402 LA

1st version kw : 280.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

H01

Prestroke mm : 5.50...5.60  
: (5.45...5.65)  
Rack travel in mm : 20.00...21.00  
Firing order : 8- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
Phasing : 270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.80...12.90

Del.quantity cm<sup>3</sup>/ : 20.6...20.8

100 s: (20.3...21.1)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.1...5.7  
Del.quantity cm<sup>3</sup>/ : 1.0...1.6  
100 s: (0.7...1.9)  
Spread cm<sup>3</sup> : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1030  
Aneroid pressure h: 1200  
Del.quantity : 206.0...208.0  
1000 : (203.0...211.0)  
Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Testing:  
1st rack travel in: 11.90

Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1150...1168  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 5.10...5.70  
Rack travel in mm : 2.00  
Speed rpm : 350...410

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1030  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 900  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.50...10.70

##### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.20...11.30  
2nd pressure hPa : 750  
Rack travel in m: 12.80...13.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 700  
Del.quantity cm3/ : 233.0...235.0  
1000 s: (230.0...238.0)

Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 134.0...136.0  
1000 s: (131.0...139.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.90  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

Observe VDT-I-420/120

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 678 822

Injection pump  
Pump designation : PE8P120A320LS7840-2  
EP type number : 0 412 628 873  
Governor  
Governor design. : RSV350...1050POA535  
-10  
Governor no. : 0 421 833 395

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM 442 A

1st version kW : 250.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness : 8.00x2.50x1000  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

H03

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 3- 7- 2- 6- 3- 5-  
4- 1

Phasing : 0-45-90-135-180-225-  
Phasing : 270-315  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 8

## BASIC SETTING

1st speed rpm : 1030

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 19.3...19.5

100 s: (19.0...19.8)

Spread cm3 : 0.6

100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 4.8...5.4  
Del.quantity cm3/ : 1.0...1.6  
100 s: (0.7...1.9)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...0.70

Governor spring pre-tension  
Click setting x : ?

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1030  
Aneroid pressure h: 1200  
Del.quantity : 193.0...195.0  
1000 : (190.0...198.0)  
Spread cm3 : 6.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 95...103

Testing:

1st rack travel in: 11.70  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1150...1168  
4th rack travel in: 1300  
Speed rpm : 0.30...1.40

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.1

Testing:

Speed rpm : 100  
Minimum rack travel: 19.50  
Speed rpm : 350  
Rack travel in mm : 4.80...5.40  
Rack travel in mm : 2.00  
Speed rpm : 350...410

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1030  
Rack travel in m: 12.60...12.70  
2nd speed rpm : 900  
Rack travel in m: 12.90...13.10  
3rd speed rpm : 700  
Rack travel in m: 13.30...13.50

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.30...11.50

Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.70...11.80  
2nd pressure hPa : 700  
Rack travel in m: 12.90...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200  
Speed rpm : 700

H04

Del.quantity cm<sup>3</sup>/ : 209.0...211.0  
1000 s: (206.0...214.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 136.0...138.0  
1000 s: (133.0...141.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.70  
Speed rpm : 1070...1080

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

Observe VDT-I-420/120

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 r  
Edition : 08.12.92  
Replaces : 05.92  
Test oil : ISO-4113

Combination no. : 0 402 736 807

Injection pump  
Pump designation : PES6P110A120RS7214  
EP type number : 0 412 716 805  
Governor  
Governor design. : RQV350...1100PA964  
-1K  
Governor no. : 0 421 815 253

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 201.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 115...125

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
: (4.30...4.50)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 15.80...15.90

Del.quantity cm3/ : 20.9...21.1

100 s: (20.6...21.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 2.7...3.3  
100 s: (2.5...3.5)

Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.80...2.00

2nd speed rpm : 450  
travel mm : 3.10...3.50

3rd speed rpm : 600  
travel mm : 5.10...5.50

4th speed rpm : 1000  
travel mm : 8.10...8.30

5th speed rpm : 1200  
travel mm : 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1050  
Aneroid pressure h: 1500  
Del.quantity : 209.0...211.0  
1000 : (206.0...214.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 64...72

Testing:  
1st rack travel in: 14.50  
Speed rpm : 1145...1155  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.70...5.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 650  
Rack travel in m: 13.30...13.70  
3rd speed rpm : 1100  
Rack travel in m: 15.50...15.70

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1050  
Pressure hPa : 1500  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 1050

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 335  
Rack travel in m: 10.10...10.20  
3rd pressure hPa : 845  
Rack travel in m: 13.60...14.00

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1500  
Speed rpm : 650  
Del. quantity cm3/ : 190.5...196.5  
1000 s: (187.5...199.5)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm3/ : 91.0...95.0  
1000 s: (89.0...97.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 14.50  
Speed rpm : 1145...1155

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm3/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 11.00...12.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.70...5.90  
Del. quantity cm3/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3921771

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:  
Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 : 2  
Edition : 23.10.92  
Replaces : 05.92  
Test oil : ISO-4113

Combination no. : 0 402 736 816

Injection pump  
Pump designation : PES6P110A120RS7214  
EP type number : 0 412 716 805  
Governor  
Governor design. : RQV350...1200PA964  
-8K  
Governor no. : 0 421 815 264

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 213.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 115...125

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 4.35...4.45  
: (4.30...4.50)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 14.80...14.90  
Del.quantity cm3/ : 19.3...19.5  
100 s: (19.0...19.8)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 5.6...5.8  
Del.quantity cm3/ : 2.7...3.3  
100 s: (2.5...3.5)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.80...2.00  
2nd speed rpm : 450  
travel mm : 3.10...3.50  
3rd speed rpm : 700  
travel mm : 5.90...6.30  
4th speed rpm : 1200  
travel mm : 9.00...9.20  
5th speed rpm : 1400  
travel mm : 10.70...11.10

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 1200  
Del.quantity : 193.0...195.0  
1000 : (190.0...198.0)

Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1245...1255  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
3rd rack travel in: 4.00  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 11...19

Testing:  
Speed rpm : 275  
Minimum rack travel: 7.20  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 14.80...14.90  
2nd speed rpm : 650  
Rack travel in m: 12.70...13.10  
3rd speed rpm : 1200  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1100  
Pressure hPa : 1200  
Rack travel mm : 14.80...14.90

Measurement  
Speed 1/min : 1100

1st pressure hPa : -  
Rack travel in m: 7.80...8.20  
2nd pressure hPa : 335  
Rack travel in m: 9.60...9.70  
3rd pressure hPa : 785  
Rack travel in m: 12.80...13.20

H08

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm<sup>3</sup>/ : 185.0...191.0  
1000 s: (182.0...194.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 90.0...94.0  
1000 s: (88.0...96.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1245...1255

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 135.0...175.0  
1000 s: (130.0...180.0)  
Rack travel in mm : 10.70...11.70

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 27.0...33.0  
1000 s: (25.0...35.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: C.D.C. # 3921770

Start-of-delivery mark 6° cam angle  
after start of delivery cyl. 1

Bow dimension:  
Sliding-sleeve position = 37.0 mm

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : ME  
 Edition : 03.12.92  
 Replaces : 06.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 736 833  
 Injection pump  
 Pump designation : PES6P120A720LS7161  
 -11  
 EP type number : 0 412 726 877  
 Governor  
 Governor design. : RQ300/1050PA897  
 Governor no. : 0 421 801 452

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 A

1st version kW : 213.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 14.10...14.30

Del.quantity cm3/ : 20.1...20.3

100 s: (19.8...20.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.4

Del.quantity cm3/ : 1.4...2.0

100 s: (1.1...2.3)

Spread cm3 : 0.6

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 680

Del.quantity : 201.0...203.0

1000 : (198.0...206.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.50

Speed rpm : 1095...1110

2nd rack travel in: 4.00

Speed rpm : 1160...1190

4th rack travel in: 1250

Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300

Rack travel in mm : 6.2

Testing:

Speed rpm : 200

Minimum rack travel: 7.70

Speed rpm : 300

Rack travel in mm : 6.00...6.40

Rack travel in mm : 2.00

Speed rpm : 380...420

TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 1050

Rack travel in m: 13.50...13.70

2nd speed rpm : 750

Rack travel in m: 14.90...15.10

Aneroid/Altitude

Compensator Test

1st version

Setting

Speed rpm : 600

Pressure hPa : 680

Rack travel mm : 14.10...14.30

Measurement

Speed 1/min : 600

1st pressure hPa : 300

Rack travel in m: 12.40...12.60

2nd pressure hPa : 400

Rack travel in m: 13.10...13.30

3rd pressure hPa : 800

Rack travel in m: 14.20...14.30 \*

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1200

H10

Speed rpm : 1050

Del.quantity cm3/ : 192.0...196.0

1000 s: (189.0...199.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: 1200

Speed rpm : 750

Del.quantity cm3/ : 218.0...222.0

1000 s: (215.0...225.0)

Spread cm3 : 8.00

1000 s: (12.0)

Aneroid pressure h: -

Speed rpm : 500

Del.quantity cm3/ : 144.0...146.0

1000 s: (141.0...149.0)

Spread cm3 : 8.00

1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.50

Speed rpm : 1095...1110

STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 190.0...210.0

1000 s: (186.0...214.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 08.12.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 736 836

Injection pump  
Pump designation : PES6P120A12ORS7265  
EP type number : 0 412 726 882  
Governor  
Governor design. : RQV350...100CPA964  
-14K  
Governor no. : 0 421 815 325

Customer-spec. information  
Customer : C.D.C.

Engine : 6CTA-A

1st version kW : 205.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 083

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 115...125

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.95...4.05  
: (3.90...4.10)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 14.50...14.60  
Del.quantity cm3/ : 23.6...23.8  
100 s: (23.3...24.1)

Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 350.0  
Rack travel in mm : 6.4...6.6  
Del.quantity cm3/ : 2.3...2.9  
100 s: (2.1...3.1)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
travel mm : 1.80...2.00  
2nd speed rpm : 450  
travel mm : 3.10...3.50  
3rd speed rpm : 600  
travel mm : 5.10...5.50  
4th speed rpm : 1000  
travel mm : 8.10...8.30  
5th speed rpm : 1200  
travel mm : 9.60...10.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1200  
Del.quantity : 236.5...238.5  
1000 : (233.5...241.5)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 13.30  
Speed rpm : 1150...1160  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 14.00  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 12...20

Testing:  
Speed rpm : 275  
Minimum rack travel: 8.00  
Speed rpm : 350  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 650  
Rack travel in m: 13.10...13.50  
3rd speed rpm : 1100  
Rack travel in m: 14.30...14.50  
4th speed rpm : 750  
Rack travel in m: 13.50...13.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1000  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 1000

1st pressure hPa : -  
Rack travel in m: 9.90...10.30  
2nd pressure hPa : 310  
Rack travel in m: 11.30...11.40  
3rd pressure hPa : 680

H12

Rack travel in m: 13.40...13.80

#### START CUT-OUT

Speed 1/min : 290 (300)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 650  
Del.quantity cm3/ : 212.0...218.0  
1000 s: (209.0...221.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: 1200  
Speed rpm : 750  
Del.quantity cm3/ : 225.0...231.0  
1000 s: (222.0...234.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 90.5...94.5  
1000 s: (88.5...92.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1150...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 190.0...230.0  
1000 s: (185.0...235.0)  
Rack travel in mm : 12.00...13.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 23.0...29.0  
1000 s: (21.0...31.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: C.D.C. # 3922427

Start-of-delivery mark = 5.5° after  
start of delivery cyl. 1.

Bow dimension:

Sliding-sleeve position = 37.0 mm



# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a3  
Edition : 23.10.92  
Replaces : 12.90  
Test oil : ISO-4113

Combination no. : 0 402 746 852

Injection pump  
Pump designation : PES6P120A720RS7157  
EP type number : 0 412 726 814  
Governor  
Governor design. : RQV325...900PA909K  
Governor no. : 0 421 815 210

Customer-spec. information  
Customer : MACK TRUCKS

Engine : E7-400

1st version kW : 298.0  
Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
: (2.70...2.90)  
Rack travel in mm : 10.50  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 15.80...15.90

Del.quantity cm3/ : 27.5...27.7  
100 s: (27.2...28.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 325.0  
Rack travel in mm : 5.1...5.3  
Del.quantity cm3/ : 4.0...4.6  
100 s: (3.8...4.8)  
Spread cm3 : 0.8  
100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325  
travel mm : 1.20...1.40  
2nd speed rpm : 450  
travel mm : 2.80...3.20  
3rd speed rpm : 650  
travel mm : 5.60...5.80  
4th speed rpm : 900  
travel mm : 8.30...8.50  
5th speed rpm : 1100  
travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 275.0...277.0  
1000 : (272.0...280.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 14.80  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.30  
Speed rpm : 325  
Rack travel in mm : 5.10...5.30

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 15.80...15.90  
2nd speed rpm : 625  
Rack travel in m: 15.20...15.40  
3rd speed rpm : 700  
Rack travel in m: 15.40...15.60  
4th speed rpm : 500  
Rack travel in m: 0.00...13.50

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 15.80...15.90

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 325  
Rack travel in m: 10.20...10.30  
3rd pressure hPa : 790  
Rack travel in m: 13.80...14.20

START CUT-OUT

H15

Speed 1/min : 275 (285)

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm<sup>3</sup>/ : 302.5...308.5  
1000 s: (299.5...311.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 850  
Del.quantity cm<sup>3</sup>/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 157.5...161.5  
1000 s: (155.5...163.5)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.80  
Speed rpm : 940...950

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (180.0...240.0)  
Rack travel in mm : 10.80...11.40

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 5.10...5.30  
Del.quantity cm<sup>3</sup>/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5185-P6

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 a4  
 Edition : 23.10.92  
 Replaces : 12.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 853  
 Injection pump  
 Pump designation : PES6P120A720RS7157  
 EP type number : 0 412 726 814  
 Governor  
 Governor design. : RQV325...900PA909-1K  
 Governor no. : 0 421 815 211

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 17...19

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 10.50  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 13.60...13.70

Del. quantity cm<sup>3</sup>/ : 23.1...23.3

100 s: (22.9...23.5)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 325.0

Rack travel in mm : 4.7...4.9

Del. quantity cm<sup>3</sup>/ : 4.0...4.6

100 s: (3.8...4.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.20...1.40

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 650

travel mm : 5.60...5.80

4th speed rpm : 900

travel mm : 8.30...8.50

5th speed rpm : 1100

travel mm : 10.30...10.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del. quantity : 231.5...233.5

1000 : (229.5...235.5)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 58...66

Testing:  
1st rack travel in: 12.60  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1080...1110  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 7...15

Testing:  
Speed rpm : 275  
Minimum rack travel: 5.90  
Speed rpm : 325  
Rack travel in mm : 4.70...4.90

CONSTANT REGULATION  
Speed rpm : 325...520

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 13.60...13.70  
2nd speed rpm : 625  
Rack travel in m: 13.30...13.50  
3rd speed rpm : 500  
Rack travel in m: 0.00...12.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 13.60...13.70

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 685  
Rack travel in m: 12.10...12.50

## START CUT-OUT

Speed 1/min : 275 (285)

H17

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 625  
Del.quantity cm3/ : 263.0...269.0  
1000 s: (260.0...272.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 850  
Del.quantity cm3/ : 159.0...161.0 \*  
1000 s: (136.5...157.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 153.0...157.0  
1000 s: (151.0...159.0)

## BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 940...950

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 175.0...215.0  
1000 s: (165.0...225.0)  
Rack travel in mm : 9.00...11.00

## LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.70...4.90  
Del.quantity cm3/ : 40.0...46.0  
1000 s: (38.0...48.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:  
: MACK # 313GC5185-P2

Bow dimension:  
Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 12,2 f1  
 Edition : 30.10.92  
 Replaces : 09.90  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 882  
 Injection pump  
 Pump designation : PES6P120A320RS7156-1  
 EP type number : 0 412 726 830  
 Governor  
 Governor design. : RQV35J...10SCPA941-1  
 Governor no. : 0 421 813 887

Customer-spec. information  
 Customer : PERKINS

Engine : 2006 TW-H

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 019

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 067

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
 : (4.45...4.65)  
 Rack travel in mm : 9.00...12.00

H18

Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 26.9...27.1

100 s: (26.6...27.4)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 350.0

Rack travel in mm : 7.8...8.4

Del.quantity cm3/ : 6.3...6.9

100 s: (6.1...7.1)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 350  
 travel mm : 0.50...0.90

2nd speed rpm : 447  
 travel mm : 4.40...4.90

3rd speed rpm : 540  
 travel mm : 4.90...5.10

4th speed rpm : 1104  
 travel mm : 5.20...5.40

5th speed rpm : 1134  
 travel mm : 5.90...6.10

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 800

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1200

Del.quantity : 269.0...271.0

1000 : (266.0...274.0)

Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 98...106

Testing:  
1st rack travel in: 13.00  
Speed rpm : 1090...1105  
2nd rack travel in: 4.00  
Speed rpm : 1180...1210  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74

Testing:  
Speed rpm : 200  
Minimum rack travel: 10.00  
Speed rpm : 350  
Rack travel in mm : 8.00...8.20  
Rack travel in mm : 2.00  
Speed rpm : 400...460  
Speed rpm : 500  
Maximum rack travel: 1.80

CONSTANT REGULATION  
Speed rpm : 350...420

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 14.00...14.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.70...11.10  
2nd pressure hPa : 710  
Rack travel in m: 13.10...13.20  
3rd pressure hPa : 560  
Rack travel in m: 11.80...12.00

#### START CUT-OUT

Speed 1/min : 300 (320)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 275.0...281.0  
1000 s: (272.0...284.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm3/ : 182.0...184.0  
1000 s: (179.0...187.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 13.00  
Speed rpm : 1090...1105

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 185.0...225.0  
1000 s: (181.0...229.0)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h3  
 Edition : 23.10.92  
 Replaces : 09.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 887  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...975PA944-2K  
 Governor no. : 0 421 815 237

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-300A

1st version kW : 224.0  
 Rated speed : 1950  
 2nd version kW : 224.0  
 Rated speed : 1950

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

# BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 975

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 21.8...22.0

100 s: (21.5...22.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

1st speed rpm : 975

Rack travel in mm : 13.0...13.1

Del.quantity cm3/ : 22.5...22.7

100 s: (22.2...23.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.8...5.0

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 950

travel mm : 7.90...8.10

4th speed rpm : 1200  
travel mm : 10.20...10.60

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del. quantity : 218.5...220.5  
1000 : (215.5...223.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del. quantity cm<sup>3</sup>/ : 225.0...227.0  
1000 s: (222.0...230.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 57...65

##### Testing:

1st rack travel in: 12.00  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1170...1200  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 57...65

##### Testing:

1st rack travel in: 12.00  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1180...1190  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16  
Setting point w/out bumper spring  
Speed rpm : 340  
Rack travel in mm : 4.9

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 975  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 600  
Rack travel in m: 12.20...12.40  
3rd speed rpm : 500  
Rack travel in m: 11.20...11.60

#### Torque control curve - 2nd version

1st speed rpm : 975  
Rack travel in m: 13.0...13.1  
2nd speed rpm : 600  
Rack travel in m: 12.2...12.4  
3rd speed rpm : 500  
Rack travel in m: 11.2...11.6

#### Aneroid/Altitude Compensator Test

##### 1st version

Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 13.00...13.10

##### Measurement

Speed 1/min : 975

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 640  
Rack travel in m: 11.70...12.10

##### 2th version

Setting  
Speed rpm : 975  
Pressure hPa : 1200  
Rack travel in mm : 13.0...13.1

##### Measurement

Speed rpm : 975

1st pressure hPa : -  
Rack travel in m: 8.00...8.40  
2nd pressure hPa : 325  
Rack travel in m: 9.40...9.50  
3rd pressure hPa : 640  
Rack travel in m: 11.7...12.1

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200

Speed rpm : 600

Del.quantity cm3/ : 238.5...244.5  
1000 s: (235.5...247.5)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 149.0...153.0  
1000 s: (147.0...155.0)

### 2nd version

Aneroid pressure h: 1200

Speed rpm : 600

Del.quantity cm3/ : 240.5...246.5  
1000 s: (237.5...249.5)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (180.5...207.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 149.0...153.0  
1000 s: (147.0...155.0)

### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 1015...1025

#### 2nd version

1mm rack travel less than

full load rack tr: 12.00

Speed rpm : 1015...1045

### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)

Rack travel in mm : 19.0...21.0

### LOW IDLE

H22

Speed rpm : 340

Rack travel in mm : 4.80...5.00

Del.quantity cm3/ : 31.0...37.0  
1000 s: (29.0...39.0)

Spread cm3 : 8.00  
1000 s: (12.00)

### Remarks:

: MACK # 313GC5188-P8

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

### Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.



4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity : 234.0...236.0  
1000 : (231.0...239.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity cm<sup>3</sup>/ : 235.5...237.5  
1000 s: (232.5...240.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 60...68

##### Testing:

1st rack travel in: 12.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 60...68

##### Testing:

1st rack travel in: 12.20  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1065...1075  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

Speed rpm : 325...520

H24

#### TORQUE CONTROL

Dimension a mm : ?

##### Torque control curve - 1st version

1st speed rpm : 875  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 510  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 600  
Rack travel in m: 13.80...14.00  
4th speed rpm : 450  
Rack travel in m: 12.90...13.30

##### Torque control curve - 2nd version

1st speed rpm : 875  
Rack travel in m: 13.2...13.3  
2nd speed rpm : 510  
Rack travel in m: 13.8...14.0  
3rd speed rpm : 600  
Rack travel in m: 13.8...14.0  
4th speed rpm : 450  
Rack travel in m: 12.9...13.3

#### Aneroid/Altitude

##### Compensator Test

##### 1st version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.80...14.00

##### Measurement

Speed 1/min : 510

##### 1st pressure hPa : -

Rack travel in m: 8.40...8.80

##### 2nd pressure hPa : 310

Rack travel in m: 10.10...10.20

##### 3rd pressure hPa : 635

Rack travel in m: 12.60...13.00

##### 2th version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel in mm : 13.8...14.0

##### Measurement

Speed rpm : 510

##### 1st pressure hPa : -

Rack travel in m: 8.40...8.80

##### 2nd pressure hPa : 310

Rack travel in m: 10.1...10.2

##### 3rd pressure hPa : 635

Rack travel in m: 12.6...13.0

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 311.0...317.0  
1000 s: (308.0...320.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 155.5...159.5  
1000 s: (153.5...161.5)

##### 2nd version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 311.0...317.0  
1000 s: (308.0...320.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 155.5...159.5  
1000 s: (153.5...161.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 915...925

##### 2nd version

1mm rack travel less than

full load rack tr: 12.20

Speed rpm : 915...945

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)

H25

Rack travel in mm : 19.00...21.0

#### LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 31.0...37.0  
1000 s: (29.0...39.0)

Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P4

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h4  
Edition : 23.10.92  
Replaces : 09.92  
Test oil : ISO-4113

Combination no. : 0 402 746 891

Injection pump  
Pump designation : PES6P120A720RS7200  
EP type number : 0 412 726 833  
Governor  
Governor design. : RQV325...875FA944-OK  
Governor no. : 0 421 815 241

Customer-spec. information  
Customer : MACK TRUCKS

Engine : EM7-250

1st version kW : 187.0  
Rated speed : 1750  
2nd version kW : 187.0  
Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
: (3.20...3.40)  
Rack travel in mm : 11.00...13.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - \* : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 21.3...21.5

100 s: (21.0...21.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

1st speed rpm : 875

Rack travel in mm : 12.5...12.6

Del.quantity cm3/ : 21.5...21.7

100 s: (21.2...22.0)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30

4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity : 213.0...215.0  
1000 : (210.0...218.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

2nd version  
Speed rpm : 875  
Aneroid pressure h: 1200  
Del. quantity cm<sup>3</sup>/ : 215.0...217.0  
1000 s: (212.0...220.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 11.50  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1035...1065  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

2nd version  
Control lever  
position degrees: 62...70

Testing:  
1st rack travel in: 11.50  
Speed rpm : 915...945  
2nd rack travel in: 4.00  
Speed rpm : 1045...1055  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

CONSTANT REGULATION  
Speed rpm : 325...520

H27

TORQUE CONTROL  
Dimension a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 875  
Rack travel in m: 12.50...12.60  
2nd speed rpm : 510  
Rack travel in m: 13.40...13.60  
3rd speed rpm : 600  
Rack travel in m: 13.40...13.60  
4th speed rpm : 450  
Rack travel in m: 12.60...13.00

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 13.40...13.60

Measurement  
Speed 1/min : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 285  
Rack travel in m: 10.00...10.10  
3rd pressure hPa : 570  
Rack travel in m: 12.30...12.70

2th version  
Setting  
Speed rpm : 510  
Pressure hPa : 1200  
Rack travel in mm : 13.4...13.6

Measurement  
Speed rpm : 510

1st pressure hPa : -  
Rack travel in m: 8.50...8.90  
2nd pressure hPa : 285  
Rack travel in m: 10.0...10.1  
3rd pressure hPa : 570  
Rack travel in m: 12.3...12.7

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 510  
Del. quantity cm<sup>3</sup>/ : 291.5...297.5  
1000 s: (288.5...300.5)

Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 153.0...157.0  
1000 s: (151.0...159.0)

#### 2nd version

Aneroid pressure h: 1200  
Speed rpm : 510  
Del.quantity cm<sup>3</sup>/ : 291.5...297.5  
1000 s: (288.5...300.5)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm<sup>3</sup>/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm<sup>3</sup>/ : 153.0...157.0  
1000 s: (151.0...159.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.50  
Speed rpm : 915...925

##### 2nd version

1mm rack travel less than  
full load rack tr: 11.50  
Speed rpm : 915...945

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.0...21.0

#### LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.60...4.80  
Del.quantity cm<sup>3</sup>/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

#### Remarks:

: MACK # 313GC5188-P2

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

#### Bow dimension:

Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

Note remarks

Combination no. : 0 402 746 892

Engine : E7-250A

## TEST BENCH REQUIREMENTS

Overflow valve : 2 417 413 011

Overflow  
quantity min. 1/h: 160...170

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test Lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values

Test pressure, bar: 22...24

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

1st speed      rpm : 975

Rack travel in mm : 12.30...12.40

Del.quantity cm<sup>3</sup>/ : 20.2...20.4  
100 s: (19.9...20.7)

$$\frac{\text{Spread cm}^3 : 0.5}{100 \text{ s} : (0.9)}$$

```

2nd speed      rpm : 340.0
Rack travel in mm : 4.8...5.0
Del.quantity cm3/ : 3.1...3.7
                100 s: (2.9...3.9)
Spread         cm3 : 0.8
                100 s: (1.2)

```

```

1st speed      rpm : 975
Rack travel in mm : 12.3...12.4
Del.quantity cm3/ : 20.5...20.7
                100 s: (20.2..21.0)
Spread         cm3 : 0.5
                100 s: (0.9)

```

```

2nd speed      rpm : 340
Rack travel in mm : 4.80...5.00
Del.quantity cm3/ : 3.1...3.7
100 s : (2.9...3.9)
Spread         cm3 : 0.8
100 s : (1.2)

```

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed	rpm	: 325
travel mm	:	1.40...1.60
2nd speed	rpm	: 450
travel mm	:	2.80...3.20
3rd speed	rpm	: 950
travel mm	:	7.90...8.10

4th speed rpm : 1200  
travel mm : 10.20...10.60

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del.quantity : 202.0...204.0  
1000 : (199.0...207.0)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 975  
Aneroid pressure h: 1200  
Del.quantity cm<sup>3</sup>/ : 205.5...207.5  
1000 s: (202.5...210.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 57...65

##### Testing:

1st rack travel in: 11.30  
Speed rpm : 1015...1025  
2nd rack travel in: 4.00  
Speed rpm : 1165...1195  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 57...65

##### Testing:

1st rack travel in: 11.30  
Speed rpm : 1015...1045  
2nd rack travel in: 4.00  
Speed rpm : 1175...1185  
4th rack travel in: 1300  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.80...5.00

#### CONSTANT REGULATION

Speed rpm : 325...520

#### TORQUE CONTROL

J02

Dimension a mm : ?

#### Torque control curve - 1st version

1st speed rpm : 975  
Rack travel in m: 12.30...12.40  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.30  
3rd speed rpm : 800  
Rack travel in m: 12.30...12.50  
4th speed rpm : 500  
Rack travel in m: 11.40...11.80

#### Torque control curve - 2nd version

1st speed rpm : 975  
Rack travel in m: 12.3...12.4  
2nd speed rpm : 600  
Rack travel in m: 12.1...12.3  
3rd speed rpm : 800  
Rack travel in m: 12.3...12.5  
4th speed rpm : 500  
Rack travel in m: 11.4...11.8

#### Aneroid/Altitude

##### Compensator Test

##### 1st version

##### Setting

Speed rpm : 975  
Pressure hPa : 1200  
Rack travel mm : 12.30...12.40

##### Measurement

Speed 1/min : 975

##### 1st pressure hPa : -

Rack travel in m: 8.50...8.90

##### 2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

##### 3rd pressure hPa : 570

Rack travel in m: 11.40...11.80

##### 2th version

##### Setting

Speed rpm : 975  
Pressure hPa : 1200  
Rack travel in mm : 12.3...12.4

##### Measurement

Speed rpm : 975

##### 1st pressure hPa : -

Rack travel in m: 8.50...8.90

##### 2nd pressure hPa : 330

Rack travel in m: 9.70...9.80

##### 3rd pressure hPa : 570

Rack travel in m: 11.4...11.8

#### START CUT-OUT

Speed 1/min : 250 (255)

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

### 2nd version

Aneroid pressure h: 1200  
Speed rpm : 600  
Del.quantity cm3/ : 233.0...239.0  
1000 s: (230.0...242.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Speed rpm : 875  
Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (150.0...172.0)  
Aneroid pressure h: -  
Speed rpm : 400  
Del.quantity cm3/ : 154.0...158.0  
1000 s: (152.0...160.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1015...1025

### 2nd version

1mm rack travel less than  
full load rack tr: 11.30  
Speed rpm : 1015...1045

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.00...21.00

Speed rpm : 100  
Del.quantity cm3/ : 170.0...210.0  
1000 s: (160.0...220.0)  
Rack travel in mm : 19.0...21.0

## LOW IDLE

Speed rpm : 340  
Rack travel in mm : 4.80...5.00  
Del.quantity cm3/ : 31.0...37.0  
1000 s: (29.0...39.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

### Remarks:

: MACK # 313GC5188-P6

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

### Bow dimension:

Sliding-sleeve position = 37.0 mm  
\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h2  
 Edition : 23.10.92  
 Replaces : 21.9.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 896  
 Injection pump  
 Pump designation : PES6P120A72ORS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RQV325...900FA944-11  
 K  
 Governor no. : 0 421 815 260

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : E7-350

1st version kW : 261.0  
 Rated speed : 1800  
 2nd version kW : 261.0  
 Rated speed : 1800

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 2.75...2.85  
 : (2.70...2.90)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 14.50...14.60

Del.quantity cm3/ : 27.1...27.3

100 s: (26.8...27.6)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

1st speed rpm : 900

Rack travel in mm : 14.5...14.6

Del.quantity cm3/ : 27.7...27.9

100 s: (27.4...27.9)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 2.80...3.20

3rd speed rpm : 700

travel mm : 6.00...6.40  
4th speed rpm : 900  
travel mm : 8.50...8.70  
5th speed rpm : 1050  
travel mm : 9.80...10.20

#### FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity : 271.0...273.0  
1000 : (268.0...276.0)  
Spread cm3 : 5.00  
1000 : (9.00)

2nd version  
Speed rpm : 900  
Aneroid pressure h: 1200  
Del.quantity cm3/ : 277.5...279.5  
1000 s: (274.5...282.5)  
Spread cm3 : 5.00  
1000 s: (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.50  
Speed rpm : 940...950  
2nd rack travel in: 4.00  
Speed rpm : 1105...1135  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

2nd version  
Control lever  
position degrees: 59...67

Testing:  
1st rack travel in: 13.50  
Speed rpm : 940...990  
2nd rack travel in: 4.00  
Speed rpm : 1115...1125  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 8...16

Testing:  
Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

J05

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension: a mm : ?  
Torque control curve - 1st version  
1st speed rpm : 900  
Rack travel in m: 14.50...14.60  
2nd speed rpm : 625  
Rack travel in m: 13.80...14.00  
3rd speed rpm : 675  
Rack travel in m: 13.80...14.00  
4th speed rpm : 500  
Rack travel in m: 11.90...12.70

Torque control curve - 2nd version  
1st speed rpm : 900  
Rack travel in m: 14.5...14.6  
2nd speed rpm : 625  
Rack travel in m: 13.8...14.0  
3rd speed rpm : 675  
Rack travel in m: 13.8...14.0  
4th speed rpm : 500  
Rack travel in m: 11.9...12.7

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel mm : 14.50...14.60

Measurement  
Speed 1/min : 900

1st pressure hPa : -  
Rack travel in m: 7.90...8.30  
2nd pressure hPa : 400  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 775  
Rack travel in m: 12.60...13.00

2th version  
Setting  
Speed rpm : 900  
Pressure hPa : 1200  
Rack travel in mm : 14.5...14.6

Measurement  
Speed rpm : 900

1st pressure hPa : -  
Rack travel in m: 8.10...8.50  
2nd pressure hPa : 400  
Rack travel in m: 9.80...9.90  
3rd pressure hPa : 775  
Rack travel in m: 12.6...13.0

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200

Speed rpm : 625

Del.quantity cm3/ : 290.0...296.0

1000 s: (287.0...299.0)

Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*

1000 s: (180.5...207.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 150.0...154.0

1000 s: (148.0...156.0)

##### 2nd version

Aneroid pressure h: 1200

Speed rpm : 625

Del.quantity cm3/ : 290.0...296.0

1000 s: (287.0...299.0)

Spread cm3 : 8.00

1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*

1000 s: (180.5...207.5)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 150.0...154.0

1000 s: (148.0...156.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 940...950

##### 2nd version

1mm rack travel less than

full load rack tr: 13.50

Speed rpm : 940...990

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 170.0...210.0

1000 s: (160.0...220.0)

Rack travel in mm : 19.0...21.0

#### LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 31.0...37.0

1000 s: (29.0...39.0)

Spread cm3 : 8.00

1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P12

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAC 12,0 h.1  
 Edition : 23.10.92  
 Replaces : 09.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 897  
 Injection pump  
 Pump designation : PES6P120A720RS7200  
 EP type number : 0 412 726 833  
 Governor  
 Governor design. : RGV325...875PA944-12  
 K  
 Governor no. : 0 421 815 261

Customer-spec. information  
 Customer : MACK TRUCKS

Engine : EM7-300

1st version kW : 224.0  
 Rated speed : 1750  
 2nd version kW : 224.0  
 Rated speed : 1750

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 2 417 413 011

Overflow  
 quantity min. 1/h: 160...170

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 22...24

Prestroke mm : 3.25...3.35  
 : (3.20...3.40)  
 Rack travel in mm : 11.00...13.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 875

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 25.3...25.5

100 s: (25.0...25.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340.0

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

1st speed rpm : 875

Rack travel in mm : 14.0...14.1

Del.quantity cm3/ : 25.0...25.2

100 s: (24.7...25.5)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 340

Rack travel in mm : 4.6...4.8

Del.quantity cm3/ : 3.1...3.7

100 s: (2.9...3.9)

Spread cm3 : 0.8

100 s: (1.2)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 325

travel mm : 1.40...1.60

2nd speed rpm : 450

travel mm : 3.30...3.70

3rd speed rpm : 700

travel mm : 7.90...8.30  
4th speed rpm : 900  
travel mm : 9.40...9.60  
5th speed rpm : 1050  
travel mm : 10.60...11.00

#### FULL LOAD DELIV. AT FULL LOAD STOP

##### 1st version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del.quantity : 253.5...255.5  
1000 : (250.5...258.5)  
Spread cm<sup>3</sup> : 5.00  
1000 : (9.00)

##### 2nd version

Speed rpm : 875  
Aneroid pressure h: 1200  
Del.quantity cm<sup>3</sup>/ : 250.0...255.0  
1000 s: (247.0...258.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (9.00)

#### RATED SPEED

##### 1st version

Control lever  
position degrees: 61...69

##### Testing:

1st rack travel in: 13.20  
Speed rpm : 915...925  
2nd rack travel in: 4.00  
Speed rpm : 1065...1095  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

##### 2nd version

Control lever  
position degrees: 61...69

##### Testing:

1st rack travel in: 13.00  
Speed rpm : 915...965  
2nd rack travel in: 4.00  
Speed rpm : 1075...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 8...16

##### Testing:

Speed rpm : 275  
Minimum rack travel: 6.00  
Speed rpm : 340  
Rack travel in mm : 4.60...4.80

#### CONSTANT REGULATION

J08

Speed rpm : 325...520

#### TORQUE CONTROL

Dimension a mm : ?

Torque control curve - 1st version

1st speed rpm : 875  
Rack travel in m: 14.20...14.30  
2nd speed rpm : 510  
Rack travel in m: 14.80...15.00  
3rd speed rpm : 575  
Rack travel in m: 14.80...15.00  
4th speed rpm : 450  
Rack travel in m: 13.90...14.30

Torque control curve - 2nd version

1st speed rpm : 875  
Rack travel in m: 14.0...14.1  
2nd speed rpm : 510  
Rack travel in m: 14.7...14.9  
3rd speed rpm : 575  
Rack travel in m: 14.7...14.9  
4th speed rpm : 450  
Rack travel in m: 13.9...14.3

Aneroid/Altitude  
Compensator Test

##### 1st version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel mm : 14.80...15.00

##### Measurement

Speed 1/min : 510

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 370

Rack travel in m: 10.30...10.40

3rd pressure hPa : 760

Rack travel in m: 13.30...13.70

##### 2th version

##### Setting

Speed rpm : 510  
Pressure hPa : 1200  
Rack travel in mm : 14.7...14.9

##### Measurement

Speed rpm : 510

1st pressure hPa : -

Rack travel in m: 8.70...9.10

2nd pressure hPa : 370

Rack travel in m: 10.3...10.4

3rd pressure hPa : 760

Rack travel in m: 13.3...13.7

#### START CUT-OUT

Speed 1/min : 250 (255)

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 334.0...340.0  
1000 s: (331.0...343.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (159.5...183.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 156.0...160.0  
1000 s: (154.0...162.0)

##### 2nd version

Aneroid pressure h: 1200

Speed rpm : 510

Del.quantity cm3/ : 328.0...334.0  
1000 s: (325.0...337.0)

Spread cm3 : 8.00  
1000 s: (12.0)

Speed rpm : 875

Del.quantity cm3/ : 199.0...201.0 \*  
1000 s: (159.5...183.0)

Aneroid pressure h: -

Speed rpm : 400

Del.quantity cm3/ : 156.0...160.0  
1000 s: (154.0...162.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 13.20

Speed rpm : 915...925

##### 2nd version

1mm rack travel less than

full load rack tr: 13.00

Speed rpm : 915...965

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 190.0...230.0  
1000 s: (180.0...240.0)

Rack travel in mm : 19.00...21.00

Speed rpm : 100

Del.quantity cm3/ : 190.0...230.0  
1000 s: (180.0...240.0)

Rack travel in mm : 19.0...21.0

#### LOW IDLE

Speed rpm : 340

Rack travel in mm : 4.60...4.80

Del.quantity cm3/ : 31.0...37.0  
1000 s: (29.0...39.0)

Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

: MACK # 313GC5188-P10

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Bow dimension:

Sliding-sleeve position = 37.0 mm

\* This test specification applies only  
to the engine/nozzle-and-holder  
assemblies on an injection-pump test  
bench: setting for test equipment,  
check value for engine equipment.

Test specifications for versions 1  
only apply to injection pumps with  
constant-pressure valve 2 418 559 029  
and spring 2 414 612 005.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 12,0 k  
Edition : 23.10.92  
Replaces : 07.92  
Test oil : ISO-4113

Combination no. : 0 402 746 909

Injection pump  
Pump designation : PES6P120A320RS7236  
EP type number : 0 412 726 848  
Governor  
Governor design. : RQV275...1000PA1001  
-1  
Governor no. : 0 421 813 936

Customer-spec. information  
Customer : RVI

Engine : MIDR 063540 J/3

1st version kW : 306.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test Lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

J10

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 13.00...14.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 600

Rack travel in mm : 13.60...13.70

Del.quantity cm<sup>3</sup>/ : 30.1...30.3

100 s: (29.8...30.6)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 275.0

Rack travel in mm : 4.9...5.3

Del.quantity cm<sup>3</sup>/ : 2.7...3.3

100 s: (2.4...3.6)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1070  
travel mm : 8.30...8.50

2nd speed rpm : 275  
travel mm : 1.10...1.50

3rd speed rpm : 500  
travel mm : 3.60...4.20

4th speed rpm : 750  
travel mm : 5.70...6.10

5th speed rpm : 1400  
travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1150

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 600

Aneroid pressure h: 1000

Del.quantity : 301.0...303.0  
1000 : (298.0...306.0)  
Spread cm3 : 5.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 298...306

#### Testing:

1st rack travel in: 12.60  
Speed rpm : 1065...1075  
2nd rack travel in: 4.00  
Speed rpm : 1195...1225  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 242...250

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.20  
Speed rpm : 275  
Rack travel in mm : 5.00...5.20

#### CONSTANT REGULATION

Speed rpm : 310...430

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 13.60...13.70

##### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.20...8.60  
2nd pressure hPa : 600  
Rack travel in m: 12.60...12.70  
3rd pressure hPa : 240  
Rack travel in m: 9.60...10.00

#### START CUT-OUT

Speed 1/min : 225 (245)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

J11

Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 276.0...282.0  
1000 s: (273.0...285.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 145.0...147.0  
1000 s: (142.0...150.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.60  
Speed rpm : 1065...1075

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 150.0...170.0  
1000 s: (146.0...174.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 4.90...5.30  
Del.quantity cm3/ : 27.0...33.0  
1000 s: (24.0...36.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 06.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 913X  
  
Injection pump  
Pump designation : PES6P120A720LS7237  
-10  
EP type number : 0 412 726 872  
Governor  
Governor design. : RQ300/1100PA1008-1  
Governor no. : 0 421 801 592

Cust. part no. : 0200747802

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 hA

1st version kW : 184.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm3/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/ : 1.6...2.2  
100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

# 1st version

## Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

## Testing:

1st rack travel in: 12.70  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

## LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

## Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

## Aneroid/Altitude Compensator Test

## 1st version

### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.80...12.10

### Measurement

Speed 1/min : 500

1st pressure hPa : 600  
Rack travel in m: 12.30...12.40  
2nd pressure hPa : 950  
Rack travel in m: 13.00...13.20

## FUEL DELIVERY CHARACTERISTICS

## 1st version

Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 201.0...205.0  
1000 s: (198.0...208.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)

Spread cm3 : 8.00  
1000 s: (12.0)

## BREAKAWAY

## 1st version

1mm rack travel less than  
full load rack tr: 12.70  
Speed rpm : 1145...1160

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (56.0...84.0)  
Rack travel in mm : 11.80...12.20

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : RVI 9,8 o 1  
 Edition : 05.10.92  
 Replaces : 08.91  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 915  
 Injection pump  
 Pump designation : PES6P120A320RS7232  
 EP type number : 0 412 726 846  
 Governor  
 Governor design. : RQ275/105CPA999-2  
 Governor no. : 0 421 801 594

## Customer-spec. information

Customer : RVI  
 Engine : MIDR 06-20-45  
 1st version kW : 250.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 417 413 025  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 105  
 Opening  
 pressure, bar : 207...210  
 Orifice plate  
 diameter mm : 0,8  
 Test lines : 1 680 750 015  
 Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.65...4.75  
 : (4.60...4.80)  
 Rack travel in mm : 18.00...21.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 600  
 Rack travel in mm : 14.00...14.10  
 Del.quantity cm3/ : 27.0...27.2  
 100 s: (26.7...27.5)  
 Spread cm3 : 0.5  
 100 s: (0.9)

2nd speed rpm : 275.0  
 Rack travel in mm : 5.60...6.00  
 Del.quantity cm3/ : 3.2...3.6  
 100 s: (2.9...3.9)  
 Spread cm3 : 0.8  
 100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -2  
 Speed rpm : 600  
 Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 600  
 Aneroid pressure h: 1000  
 Del.quantity : 270.0...272.0  
 1000 : (267.0...275.0)  
 Spread cm3 : 5.00  
 1000 : (9.00)

## RATED SPEED

1st version  
 Setting point:  
 Speed rpm : 600  
 Rack travel in mm : 20.0

Testing:  
 1st rack travel in: 13.00  
 Speed rpm : 1125...1140  
 2nd rack travel in: 4.00

Speed rpm : 1245...1275  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 8.2

#### Testing:

Speed rpm : 175  
Minimum rack travel: 7.30  
Speed rpm : 275  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 384...420

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 600  
Rack travel in m: 14.40...14.50  
2nd speed rpm : 1050  
Rack travel in m: 14.30...14.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 1000  
Rack travel mm : 14.00...14.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.50...9.90  
2nd pressure hPa : 560  
Rack travel in m: 12.90...13.10  
3rd pressure hPa : 200  
Rack travel in m: 10.10...10.50

#### START CUT-OUT

Speed 1/min : 225 (245)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1050  
Del.quantity cm3/ : 245.0...251.0  
1000 s: (242.0...254.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 126.0...128.0  
1000 s: (123.0...131.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 13.00  
Speed rpm : 1125...1140

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...170.0  
1000 s: (136.0...174.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.60...6.00  
Del.quantity cm3/ : 32.0...36.0  
1000 s: (29.0...39.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 06.92  
Test oil : ISO-4113

Combination no. : 0 402 746 916X

Injection pump  
Pump designation : PES6P120A720LS7237-1  
EP type number : 0 412 726 872  
Governor  
Governor design. : RQ303/1100PA1010  
Governor no. : 0 421 801 596

Cust. part no. : 0200747902

Customer-spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 hA

1st version kW : 184.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness : 8.00X2.50X1000  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)

Rack travel in mm : 20.00...21.00

Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600  
Rack travel in m: 12.30...12.40  
2nd pressure hPa : 950  
Rack travel in m: 13.00...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 201.0...205.0  
1000 s: (198.0...208.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
 Edition : 23.10.92  
 Replaces : 06.92  
 Test oil : ISO-4113  
 Combination no. : 0 402 746 919X  
 Injection pump  
 Pump designation : PES6P120A720LS7237  
 -10  
 EP type number : 0 412 726 872  
 Governor  
 Governor design. : RQ300/1100FA1013-1  
 Governor no. : 0 421 801 603

Cust. part no. : 0220743402

Customer-spec. information  
 Customer : MERCEDES-BENZ

Engine : OM447 HA

1st version kW : 184.0  
 Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
 quantity min. 1/h: 100...120

Test nozzle holder  
 assembly : 1 688 901 105

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x1000

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
 : (5.15...5.35)  
 Rack travel in mm : 20.00...21.00  
 Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.70...13.90

Del.quantity cm3/ : 20.3...20.5

100 s: (20.0...20.8)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm3/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 203.0...205.0

1000 : (200.0...208.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.80  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring

Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack trave: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600  
Rack travel in m: 12.40...12.50  
2nd pressure hPa : 950  
Rack travel in m: 13.10...13.30

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 23.10.92  
Replaces : 06.92  
Test oil : ISO-4113

Combination no. : 0 402 746 923X

Injection pump  
Pump designation : PES6P120A720LS7237-1  
EP type number : 0 412 726 872  
Governor  
Governor design. : RQ300/1100PA1013-2  
Governor no. : 0 421 801 611

Cust. part no. : 0220743502

Customer spec. information  
Customer : MERCEDES-BENZ

Engine : OM447 hA

1st version kW : 184.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Overflow  
quantity min. 1/h: 100...120

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values —

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 20.00...21.00  
Firing order : 6- 2- 4- 1- 5- 3

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 6

## BASIC SETTING

1st speed rpm : 1100

Rack travel in mm : 13.60...13.80

Del.quantity cm<sup>3</sup>/ : 19.8...20.0

100 s: (19.5...20.3)

Spread cm<sup>3</sup> : 0.5

100 s: (0.9)

2nd speed rpm : 300.0

Rack travel in mm : 6.2...6.8

Del.quantity cm<sup>3</sup>/ : 1.6...2.2

100 s: (1.3...2.5)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1100

Aneroid pressure h: 1400

Del.quantity : 198.0...200.0

1000 : (195.0...203.0)

Spread cm<sup>3</sup> : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

Testing:

1st rack travel in: 12.70  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1220...1250  
4th rack travel in: 1300  
Speed rpm : 0.00...1.50

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.50

Testing:

Speed rpm : 200  
Minimum rack travel: 8.30  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Rack travel in mm : 2.00  
Speed rpm : 370...410

Aneroid/Altitude  
Compensator Test

1st version

Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.80...12.10

Measurement

Speed 1/min : 500

1st pressure hPa : 600  
Rack travel in m: 12.30...12.40  
2nd pressure hPa : 950  
Rack travel in m: 13.00...13.20

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 201.0...205.0  
1000 s: (198.0...208.0)  
Spread cm3 : 8.00  
1000 s: (12.0)  
Aneroid pressure h: -

Speed rpm : 500  
Del.quantity cm3/ : 144.0...146.0  
1000 s: (141.0...149.0)  
Spread cm3 : 8.00  
1000 s: (12.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 12.70  
Speed rpm : 1145...1160

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 200.0...220.0  
1000 s: (196.0...224.0)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER  
Edition : 27.11.92  
Replaces : 10.92  
Test oil : ISO-4113  
  
Combination no. : 0 402 746 934  
  
Injection pump  
Pump designation : PES6P120A320RS7256  
EP type number : 0 412 726 879  
Governor  
Governor design. : RGV250...950PA793-3  
Governor no. : 0 421 814 014

Customer-spec. information  
Customer : PERKINS

Engine : EAGLE TX 375/400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve  
: 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 019

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 075

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X1000

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 4.50...4.60  
: (4.45...4.65)  
Rack travel in mm : 12.00...13.00

Firing order : 1- 4- 2- 6- 3- 5

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 12.20...12.30

Del.quantity cm<sup>3</sup>/ : 26.2...26.4

100 s: (25.9...26.7)

Spread cm<sup>3</sup> : 0.6

100 s: (0.9)

2nd speed rpm : 250.0

Rack travel in mm : 4.3...4.5

Del.quantity cm<sup>3</sup>/ : 2.1...2.5

100 s: (1.8...2.8)

Spread cm<sup>3</sup> : 0.8

100 s: (1.2)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 250

travel mm : 0.90...1.40

2nd speed rpm : 315

travel mm : 1.70...2.20

3rd speed rpm : 670

travel mm : 3.90...4.40

4th speed rpm : 985

travel mm : 7.60...7.80

5th speed rpm : 1250

travel mm : 11.00...12.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1115

Rack travel in mm : 10.00...12.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Aneroid pressure h: 1200

Del.quantity : 262.0...264.0

1000 : (259.0...267.0)

Spread cm<sup>3</sup> : 6.00  
1000 : (9.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 113...121

Testing:  
1st rack travel in: 11.30  
Speed rpm : 980...990  
2nd rack travel in: 4.00  
Speed rpm : 1055...1085  
4th rack travel in: 1200  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 80...88

Testing:  
Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 250  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 250...450

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 600  
Pressure hPa : 1200  
Rack travel mm : 12.20...12.30

Measurement  
Speed 1/min : 600

1st pressure hPa : -  
Rack travel in m: 8.20...8.40  
2nd pressure hPa : 515  
Rack travel in m: 11.10...11.20  
3rd pressure hPa : 300  
Rack travel in m: 9.10...9.30

#### START CUT-OUT

Speed 1/min : 170 (190)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: -  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 142.0...144.0  
1000 s: (139.0...147.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 980...990

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 190.0...230.0  
1000 s: (187.0...233.0)  
Rack travel in mm : 20.00...21.00

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 4.30...4.50  
Del.quantity cm<sup>3</sup>/ : 21.0...25.0  
1000 s: (18.0...28.0)  
Spread cm<sup>3</sup> : 8.00  
1000 s: (12.00)

Remarks:

Delivery-valve spring pre-tension  
3.2...3.4 mm.  
Permissible alteration of 3.0...3.5 mm

Because of flattening, set the spring  
preload on new delivery-valve holders  
to 2.9...3.1 mm.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 746 937  
Injection pump  
Pump designation : PES6P120A720RS7268  
EP type number : 0 412 726 884  
Governor  
Governor design. : RQ275/1100PA915-2  
Governor no. : 0 421 801 671

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8460.41.603

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
: (5.05...5.25)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 11.50...11.60  
Del.quantity cm3/ : 18.3...18.5  
100 s: (18.0...18.8)  
Spread cm3 : 0.5  
100 s: (0.9)

2nd speed rpm : 275.0  
Rack travel in mm : 5.0...5.4  
Del.quantity cm3/ : 2.0...2.6  
100 s: (1.7...2.9)  
Spread cm3 : 0.8  
100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -2  
Speed rpm : 600  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 900  
Del.quantity : 183.0...185.0  
1000 : (180.0...188.0)  
Spread cm3 : 5.00  
1000 : (9.00)

## RATED SPEED

1st version  
Setting point:  
Speed rpm : 600  
Rack travel in mm : 20.0

Testing:  
1st rack travel in: 10.50  
Speed rpm : 1145...1160  
2nd rack travel in: 4.00  
Speed rpm : 1230...1260

4th rack travel in: 1350  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 275  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 100  
Minimum rack travel: 6.70  
Speed rpm : 275  
Rack travel in mm : 5.10...5.30  
Rack travel in mm : 2.00  
Speed rpm : 325...365

#### TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1100  
Rack travel in m: 12.00...12.10  
2nd speed rpm : 550  
Rack travel in m: 12.00...12.20

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.50...11.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 8.70...8.90  
2nd pressure hPa : 310  
Rack travel in m: 10.80...10.90  
3rd pressure hPa : 240  
Rack travel in m: 9.30...9.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 550  
Del.quantity cm3/ : 195.0...201.0  
1000 s: (192.0...204.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 104.0...106.0  
1000 s: (101.0...109.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1145...1160

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...145.0  
1000 s: (111.0...149.0)

#### LOW IDLE

Speed rpm : 275  
Rack travel in mm : 5.00...5.40  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : UNI  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 402 746 938

Injection pump  
Pump designation : PES6P120A720RS7269  
EP type number : 0 412 726 885  
Governor  
Governor design. : RQ310/1025PA872-1  
Governor no. : 0 421 801 672

Customer-spec. information  
Customer : IVECO-UNIC

Engine : 8460.21.313

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 025

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 105

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,8

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00X1.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 5.10...5.20  
: (5.05...5.25)  
Rack travel in mm : 12.00...13.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BEGINNING OF DELIVERY DIFFERENCE

betw. rack trav. m: 5.40...5.60  
& maximum rack tra: 12.0...13.0  
Difference ° CS : 2.00...4.00

## BASIC SETTING

1st speed rpm : 1025

Rack travel in mm : 12.60...12.70

Del.quantity cm3/ : 19.2...19.4

100 s: (18.9...19.7)

Spread cm3 : 0.5

100 s: (0.9)

2nd speed rpm : 310.0

Rack travel in mm : 5.7...6.1

Del.quantity cm3/ : 2.0...2.6

100 s: (1.7...2.9)

Spread cm3 : 0.8

100 s: (1.2)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -2

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1025

Aneroid pressure h: 900

Del.quantity : 192.0...194.0

1000 : (189.0...197.0)

Spread cm3 : 5.00

1000 : (9.00)

## RATED SPEED

1st version

Setting point:

Speed rpm : 600

Rack travel in mm : 20.0

Testing:

1st rack travel in: 11.60  
Speed rpm : 1070...1085  
2nd rack travel in: 4.00  
Speed rpm : 1135...1165  
4th rack travel in: 1350  
Speed rpm : 0.00...1.00

LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 310  
Rack travel in mm : 5.8

Testing:

Speed rpm : 100  
Minimum rack travel: 7.30  
Speed rpm : 310  
Rack travel in mm : 5.70...5.90  
Rack travel in mm : 2.00  
Speed rpm : 335...375

TORQUE CONTROL

Dimension a mm : -  
Torque control curve - 1st version  
1st speed rpm : 1025  
Rack travel in m: 13.10...13.20  
2nd speed rpm : 550  
Rack travel in m: 13.10...13.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 12.60...12.70

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.80...10.00  
2nd pressure hPa : 310  
Rack travel in m: 11.90...12.00  
3rd pressure hPa : 240  
Rack travel in m: 10.50...10.70

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 900  
Speed rpm : 550  
Del.quantity cm3/ : 210.0...216.0  
1000 s: (207.0...219.0)  
Aneroid pressure h: -  
Speed rpm : 500

Del.quantity cm3/ : 123.0...125.0  
1000 s: (120.0...128.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.60  
Speed rpm : 1070...1085

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 105.0...135.0  
1000 s: (101.0...139.0)

LOW IDLE

Speed rpm : 310  
Rack travel in mm : 5.70...6.10  
Del.quantity cm3/ : 20.0...26.0  
1000 s: (17.0...29.0)  
Spread cm3 : 8.00  
1000 s: (12.00)

Remarks:

:

Setting and blocking of pointer of  
start-of-delivery sensor on cyl. 1  
start of delivery

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

On activation of the starting solenoid,  
the start position must be reached.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PEN  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 402 846 054  
Injection pump  
Pump designation : PE6P120A32ORS8017  
EP type number : 0 412 826 018  
Governor  
Governor design. : RQV300...1100PA1017  
-1  
Governor no. : 0 421 814 023

Customer-spec. information  
Customer : PENTA

Engine : TWD 1030 ME

1st version kW : 212.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 2 417 413 078

Inlet press., bar : 2.50

Test nozzle holder  
assembly : 1 688 901 103

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,7

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 25...27

Prestroke mm : 4.10...4.20  
: (4.05...4.25)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.30 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 700  
Rack travel in mm : 11.00...11.10

Del.quantity cm3/ : 21.0...21.2  
100 s: (20.7...21.5)

Spread cm3 : 0.6  
100 s: (1.0)

2nd speed rpm : 300.0  
Rack travel in mm : 4.3...4.5  
Del.quantity cm3/ : 1.7...2.3  
100 s: (1.5...2.5)  
Spread cm3 : 0.7  
100 s: (1.1)

(B) Setting of injection pump  
with governor

GUIDE SLEEVE TRAVEL  
1st speed rpm : 300  
travel mm : 0.90...1.30  
2nd speed rpm : 500  
travel mm : 2.60...3.20  
3rd speed rpm : 800  
travel mm : 4.90...5.50  
4th speed rpm : 1150  
travel mm : 8.20...8.40  
5th speed rpm : 1300  
travel mm : 10.10...10.50

GUIDE SLEEVE POSITION  
Control-lever position  
Degree: -1  
Speed rpm : 1160  
Rack travel in mm : 15.20...17.80

FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700

Aneroid pressure h: 1200  
Del.quantity : 210.0...212.0  
1000 : (207.0...215.0)  
Spread cm3 : 6.00  
1000 : (10.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 110...118

Testing:  
1st rack travel in: 10.00  
Speed rpm : 1120...1130  
2nd rack travel in: 4.00  
Speed rpm : 1190...1220  
4th rack travel in: 1320  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 78...86

Testing:  
Speed rpm : 100  
Minimum rack travel: 5.90  
Speed rpm : 300  
Rack travel in mm : 4.30...4.50

CONSTANT REGULATION  
Speed rpm : 300...360

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : 1200  
Rack travel mm : 11.00...11.10

Measurement  
Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 7.60...7.80  
2nd pressure hPa : 260  
Rack travel in m: 7.80...7.90 \*

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1200  
Speed rpm : 1100  
Del.quantity cm3/ : 179.0...185.0  
1000 s: (176.0...188.0)

Spread cm3 : 10.00  
1000 s: (14.0)  
Aneroid pressure h: -  
Speed rpm : 700  
Del.quantity cm3/ : 130.5...132.5  
1000 s: (127.5...135.5)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 10.00  
Speed rpm : 1120...1130

Remarks:

\* Increase in control-rod travel with  
respect to setting at least 0.1 mm

#### APPLICATION

Ship

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 21.09.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 244 030  
  
Injection pump  
Pump designation : PES4MW100/720RS1513  
EP type number : 0 413 204 011  
Governor  
Governor design. : RQV300...1300MW119  
Governor no. : 0 420 083 251

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 5.20...5.30  
: (5.15...5.35)  
Rack travel in mm : 21.00...0.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 11.8...12.0

100 s: (11.6...12.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.2...4.4

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.40...8.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1300

Aneroid pressure h: 1000

Del.quantity : 118.0...120.0

1000 : (116.0...122.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

### Testing:

1st rack travel in: 11.80

Speed rpm : 1340...1350

2nd rack tra l in: 4.00

Speed rpm : 1455...1485  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.3

#### Testing:

Speed rpm : 200  
Minimum rack travel: 6.00  
Speed rpm : 300  
Rack travel in mm : 4.20...4.40

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 7.90...8.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 8.70...8.90  
2nd pressure hPa : 500  
Rack travel in m: 10.90...11.00  
3rd pressure hPa : 1000  
Rack travel in m: 12.80...12.90

#### START CUT-CUT

Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 115.0...118.0  
1000 s: (112.5...120.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 47.5...49.5  
1000 s: (45.5...51.5)

#### BREAKAWAY

#### 1st version

K03

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 115.0...125.0  
1000 s: (112.0...128.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.20...4.40  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 F 1  
 Edition : 27.11.92  
 Replaces : 04.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 436 105  
 Injection pump  
 Pump designation : PES6MW100/120RS1169  
 EP type number : 0 413 406 153  
 Governor  
 Governor design. : RQV350...1200MW78-1  
 Governor no. : 0 420 083 156

Customer-spec. information  
 Customer : CDC

Engine : 6CTA830

1st version kW : 197.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Inlet press., bar : 1.50  
 Test nozzle holder  
 assembly : 1 688 901 017  
 Opening  
 pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
 : (2.95...3.15)  
 Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.90...12.00

Del. quantity cm3/ : 14.1...14.3

100 s: (13.9...14.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.6...5.8

Del. quantity cm3/ : 1.6...2.0

100 s: (1.4...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.60...9.00

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 800

travel mm : 4.90...5.50

4th speed rpm : 350

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 600

Del. quantity : 141.0...143.0

1000 : (139.0...145.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 42...50

Testing:

1st rack travel in: 10.90

Speed rpm : 1240...1250

2nd rack travel in: 4.00

Speed rpm : 1385...1415

4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position: degrees: 10...18  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.50  
Speed rpm : 350  
Rack travel in mm : 5.60...5.80

#### CONSTANT REGULATION

Speed rpm : 370...500

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 345  
Rack travel mm : 10.40...10.50

#### Measurement

Speed 1/min : 500

1st pressure hPa : 600  
Rack travel in m: 11.90...12.00  
2nd pressure hPa : -  
Rack travel in m: 10.00...10.20  
3rd pressure hPa : 500  
Rack travel in m: 11.60...11.90

#### START CUT-OUT

Speed 1/min : 220 (240)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 600  
Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 137.5...141.5  
1000 s: (135.0...143.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 101.0...103.0  
1000 s: (99.0...105.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (6.00)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.90  
Speed rpm : 1240...1250

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 218.0...228.0  
1000 s: (215.0...231.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.60...5.80  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (14.0...22.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery mark 10.5° cam angle  
after start of delivery cyl. 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER  
 Edition : 23.10.92  
 Replaces : 09.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 436 114  
 Injection pump  
 Pump designation : PES6MW100/320/3RS119  
 4-1  
 EP type number : 0 413 406 221  
 Governor  
 Governor design. : RQV300...1300MW108K  
 Governor no. : 0 420 083 998

Customer-spec. information  
 Customer : PERKINS

Engine : 180 TI

1st version kW : 134.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 1 688 901 101

Opening  
 pressure, bar : 207...210

Orifice plate  
 diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
 : (3.25...3.45)  
 Rack travel in mm : 12.00...14.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.30...14.40

Del.quantity cm3/ : 13.4...13.6

100 s: (13.2...13.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 10.00...10.40

2nd speed rpm : 900

travel mm : 6.40...6.60

3rd speed rpm : 480

travel mm : 3.10...3.70

4th speed rpm : 300

travel mm : 1.40...1.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 134.0...136.0  
1000 : (132.0...138.0)  
Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Setting point:

Speed rpm : 1380  
Rack travel in mm : 16,5

#### Testing:

1st rack travel in: 13.30  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

#### CONSTANT REGULATION

Speed rpm : 330...500

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 800  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 500  
Rack travel in m: 11.70...11.90  
4th speed rpm : 1000  
Rack travel in m: 13.60...13.90  
5th speed rpm : 700  
Rack travel in m: 12.60...12.90

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : -

K07

Rack travel mm : 9.20...9.40

#### Measurement

Speed 1/min : 1300

1st pressure hPa : 180  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 220  
Rack travel in m: 10.90...11.20  
3rd pressure hPa : 900  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 240 (250)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 126.0...129.0  
1000 s: (123.5...131.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.0...63.0  
1000 s: (59.0...65.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.30  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...92.0  
1000 s: (75.0...95.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 5,8 D  
Edition : 23.10.92  
Replaces : 04.92  
Test oil : ISO-4113

Combination no. : 0 403 444 119

Injection pump  
Pump designation : PES4MW100/320RS1199  
EF type number : 0 413 404 112  
Governor  
Governor design. : RQV300...1300MW110K  
Governor no. : 0 420 083 996

Customer-spec. information  
Customer : PERKINS

Engine : 110 TI

1st version kW : 82.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
: (3.25...3.45)  
Rack travel in mm : 12.00...14.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.00...13.10

Del.quantity cm3/ : 12.4...12.6

100 s: (12.2...12.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 10.00...10.40

2nd speed rpm : 900

travel mm : 6.40...6.60

3rd speed rpm : 480

travel mm : 3.10...3.70

4th speed rpm : 300

travel mm : 1.40...1.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 124.0...126.0

1000 : (122.0...128.0)

Spread cm3 : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Setting point:  
Speed rpm : 1380  
Rack travel in mm : 16.5

Testing:  
1st rack travel in: 12.00  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1450...1480  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 66...74  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

CONSTANT REGULATION  
Speed rpm : 330...500

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 13.00...13.10  
2nd speed rpm : 800  
Rack travel in m: 12.00...12.20  
3rd speed rpm : 500  
Rack travel in m: 10.30...10.50  
4th speed rpm : 1000  
Rack travel in m: 12.40...12.70  
5th speed rpm : 400  
Rack travel in m: 9.90...10.20

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 1300  
Pressure hPa : -  
Rack travel mm : 9.20...9.40

Measurement  
Speed 1/min : 1300

1st pressure hPa : 100  
Rack travel in m: 9.80...9.90  
2nd pressure hPa : 150  
Rack travel in m: 10.80...11.10  
3rd pressure hPa : 900  
Rack travel in m: 13.00...13.10

#### START CUT-OUT

Speed 1/min : 240 (250)

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 900  
Speed rpm : 300  
Del.quantity cm3/ : 118.0...121.0  
1000 s: (115.5...123.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 61.0...63.0  
1000 s: (59.0...65.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.00  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...92.0  
1000 s: (75.0...95.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 H  
Edition : 21.09.92  
Replaces : 02.91  
Test oil : ISO-4113

Combination no. : 0 403 444 122

Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1200MW50-14  
Governor no. : 0 420 083 239

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.90

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 105...113

Testing:

1st rack travel in: 9.80

Speed rpm : 1250...1260  
2nd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

#### TORQUE CONTROL

Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 1100  
Rack travel in m: 11.00...11.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 450  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.50...11.60

#### START CUT-OUT

Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600

Del.quantity cm3/ : 79.0...82.0  
1000 s: (76.5...84.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1250...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 25.09.92  
Replaces : 07.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 444 140  
  
Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1200MW50-30  
Governor no. : 0 420 083 283

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 8.6...8.8

100 s: (8.4...9.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.7...5.9

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.50...8.90

2nd speed rpm : 1250

travel mm : 7.60...7.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 86.0...88.0

1000 : (84.0...90.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 105...113

Testing:

1st rack travel in: 9.80

Speed rpm : 1250...1260  
2nd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.8

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.30  
Speed rpm : 300  
Rack travel in mm : 5.70...5.90

#### TORQUE CONTROL

Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 1100  
Rack travel in m: 11.00...11.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.50...9.70

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 450  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.50...11.60

#### START CUT-OUT

Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600

Del.quantity cm3/ : 79.0...82.0  
1000 s: (76.5...84.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1250...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.70...5.90  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 444 141  
Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1300MW50-16  
Governor no. : 0 420 083 240

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.0...6.2

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.40...8.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 108...116

Testing:

1st rack travel in: 9.80

Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 74...32  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1000  
Rack travel in m: 11.60...11.70  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

#### START CUT-OUT

Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.00...6.20  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 444 142  
  
Injection pump  
Pump designation : PES4MW100/720RS1212  
EP type number : 0 413 404 114  
Governor  
Governor design. : RQV300...1300MW50-15  
Governor no. : 0 420 083 238

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364LA

1st version kW : 102.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness : 8.00X2.50X600  
x Length mm

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 10.1...10.3

100 s: (9.9...10.5)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.4...6.6

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1340

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.30...1.70

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1340

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 101.0...103.0

1000 : (99.0...105.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 107...115

Testing:

1st rack travel in: 12.20  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.5

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.40...6.60

CONSTANT REGULATION

Speed rpm : 320...550

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.90...11.10  
2nd pressure hPa : 400  
Rack travel in m: 12.60...12.80  
3rd pressure hPa : 700  
Rack travel in m: 13.20...13.30

START CUT-OUT

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 86.0...89.0  
1000 s: (83.5...91.5)

Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 36.0...38.0  
1000 s: (34.0...40.0)

BREAKAWAY

1st version

1mm rack travel less than  
full load rack tr: 12.20  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 85.0...95.0  
1000 s: (82.0...98.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.40...6.60  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 444 143  
Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1200MW50-14  
Governor no. : 0 420 083 239

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 77.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

K20

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 8.6...8.8  
100 s: (8.4...9.0)

Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)

2nd speed rpm : 300.0  
Rack travel in mm : 6.3...6.5  
Del.quantity cm<sup>3</sup>/ : 1.0...1.4  
100 s: (0.7...1.6)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350  
travel mm : 8.50...8.90  
2nd speed rpm : 1250  
travel mm : 7.60...7.80  
3rd speed rpm : 500  
travel mm : 2.70...3.30  
4th speed rpm : 300  
travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1200  
Aneroid pressure h: 700  
Del.quantity : 86.0...88.0  
1000 : (84.0...90.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 105...113

Testing:  
1st rack travel in: 9.80

Speed rpm : 1250...1260  
2nd rack travel in: 4.00  
Speed rpm : 1350...1380  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50

#### TORQUE CONTROL

Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1200  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 1100  
Rack travel in m: 11.00...11.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.00...10.20  
2nd pressure hPa : 450  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.50...11.60

#### START CUT-OUT

Speed 1/min : 200 (230)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600

Del.quantity cm3/ : 79.0...82.0  
1000 s: (76.5...84.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1250...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 444 144  
  
Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RQV300...1300MW67-7  
Governor no. : 0 420 083 278

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 015

Outside diameter  
x Wall thickness  
x Length mm : 6.00x1.50x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.80...10.90

Del.quantity cm<sup>3</sup>/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.3...6.5

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 8.40...8.80

2nd speed rpm : 880

travel mm : 4.90...5.10

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:

1st rack travel in: 9.80  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.4

Testing:

Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Rack travel in mm : 2.00  
Speed rpm : 480...540

TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.80...10.90  
2nd speed rpm : 600  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1000  
Rack travel in m: 11.60...11.70  
4th speed rpm : 1175  
Rack travel in m: 11.30...11.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

Measurement

Speed 1/min : 500

1st pressure hPa : 150  
Rack travel in m: 10.30...10.50  
2nd pressure hPa : 300  
Rack travel in m: 11.30...11.50  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

START CUT-OUT

K23

Speed 1/min : 200 (230)

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm3/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

BREAKAWAY

1st version

1mm rack travel less than

Full load rack tr: 9.80  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 78.0...88.0  
1000 s: (75.0...91.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : PER 10,0 S  
Edition : 23.10.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 403 446 250

Injection pump  
Pump designation : PES6MW100/32ORS1194  
EP type number : 0 413 406 186  
Governor  
Governor design. : RQV300...1300MW108K  
Governor no. : 0 420 083 998

Customer spec. information  
Customer : PERKINS

Engine : 180 TI

1st version kW : 134.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
: (3.25...3.45)  
Rack travel in mm : 12.00...14.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 14.30...14.40

Del.quantity cm3/ : 13.4...13.6

100 s: (13.2...13.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1350

travel mm : 10.00...10.40

2nd speed rpm : 900

travel mm : 6.40...6.60

3rd speed rpm : 480

travel mm : 3.10...3.70

4th speed rpm : 300

travel mm : 1.40...1.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1380

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 900

Del.quantity : 134.0...136.0

1000 : (132.0...138.0)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 118...126

#### Setting point:

Speed rpm : 1380  
Rack travel in mm : 16.5

#### Testing:

1st rack travel in: 13.30  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1480...1510  
4th rack travel in: 1600  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

#### Testing:

Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

#### CONSTANT REGULATION

Speed rpm : 330...500

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1300  
Rack travel in m: 14.30...14.40  
2nd speed rpm : 800  
Rack travel in m: 13.10...13.30  
3rd speed rpm : 500  
Rack travel in m: 11.70...11.90  
4th speed rpm : 1000  
Rack travel in m: 13.60...13.90  
5th speed rpm : 700  
Rack travel in m: 12.60...12.90

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 1300  
Pressure hPa : -  
Rack travel mm : 9.20...9.40

#### Measurement

Speed 1/min : 1300

1st pressure hPa : 180  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 220  
Rack travel in m: 10.90...11.20  
3rd pressure hPa : 900  
Rack travel in m: 11.70...11.90

#### START CUT-OUT

Speed 1/min : 240 (250)

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm<sup>3</sup>/ : 126.0...129.0  
1000 s: (123.5...131.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 61.0...63.0  
1000 s: (59.0...65.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than  
full load rack tr: 13.30  
Speed rpm : 1340...1350

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...92.0  
1000 s: (75.0...95.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm<sup>3</sup>/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

Start-of-delivery blocking 46.5°  
before start of delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 25.09.92  
Replaces : 03.92  
Test oil : ISO-4113  
  
Combination no. : 0 403 446 302  
  
Injection pump  
Pump designation : PES6MW100/72ORS1131  
EP type number : 0 413 406 123  
Governor  
Governor design. : RQV300...1300MW50-24  
Governor no. : 0 420 083 270

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.75)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.90...11.00

Del.quantity cm<sup>3</sup>/ : 8.8.. 9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 6.1...6.3

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.40...10.00

2nd speed rpm : 1350

travel mm : 8.50...8.70

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 108...116

Testing:  
1st rack travel in: 9.90  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1425...1455  
4th rack travel in: 1500  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 6.2

Testing:  
Speed rpm : 200  
Minimum rack travel: 8.00  
Speed rpm : 300  
Rack travel in mm : 6.10...6.30

TORQUE CONTROL  
Dimension a mm : 0.70  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 750  
Rack travel in m: 11.60...11.70  
3rd speed rpm : 1100  
Rack travel in m: 11.10...11.30

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...9.90

Measurement  
Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 300  
Rack travel in m: 11.00...11.30  
3rd pressure hPa : 700  
Rack travel in m: 11.60...11.70

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

K28

1st version  
Aneroid pressure h: 700  
Speed rpm : 750  
Del.quantity cm3/ : 86.0...89.0  
1000 s: (83.5...91.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MWM 6,2 F  
 Edition : 23.10.92  
 Replaces : 08.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 446 306  
 Injection pump  
 Pump designation : PES6MW100/720RS1131  
 EP type number : 0 413 406 123  
 Governor  
 Governor design. : RGV300...1300MW67-6  
 Governor no. : 0 420 083 274

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 121.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 715 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)  
 Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1300

Rack travel in mm : 10.50...10.60

Del.quantity cm<sup>3</sup>/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 5.6...5.8

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1450

travel mm : 9.50...9.90

2nd speed rpm : 1350

travel mm : 8.60...8.80

3rd speed rpm : 500

travel mm : 2.70...3.30

4th speed rpm : 300

travel mm : 1.20...1.60

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -1

Speed rpm : 1350

Rack travel in mm : 15.20...17.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1300

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 116...124

Testing:  
1st rack travel in: 9.50  
Speed rpm : 1340...1350  
2nd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 5.7

Testing:  
Speed rpm : 200  
Minimum rack travel: 7.50  
Speed rpm : 300  
Rack travel in mm : 5.60...5.80

TORQUE CONTROL  
Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1300  
Rack travel in m: 10.50...10.60  
2nd speed rpm : 850  
Rack travel in m: 11.20...11.40  
3rd speed rpm : 1100  
Rack travel in m: 10.70...10.90

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.20...9.30

Measurement  
Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 9.70...9.90  
2nd pressure hPa : 400  
Rack travel in m: 10.40...10.60  
3rd pressure hPa : 700  
Rack travel in m: 11.20...11.40

START CUT-OUT

Speed 1/min : 220 (240)

FUEL DELIVERY CHARACTERISTICS

L02

1st version  
Aneroid pressure h: 700  
Speed rpm : 850  
Del.quantity cm3/ : 88.0...91.0  
1000 s: (85.5...93.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 49.0...51.0  
1000 s: (47.0...53.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.50  
Speed rpm : 1340...1350

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 80.0...90.0  
1000 s: (77.0...93.0)

LOW IDLE

Speed rpm : 300  
Rack travel in mm : 5.60...5.80  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : DAF  
Edition : 27.11.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 446 314

Injection pump  
Pump designation : PES6MW100/320RS1227  
EP type number : 0 413 406 215  
Governor  
Governor design. : RQ325/1300MW129  
Governor no. : 0 420 082 070

Cust. part no. : 1249932

Customer-spec. information  
Customer : DAF

Engine : NS156L

1st version kW : 156.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

L03

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 14.00...15.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000  
Rack travel in mm : 13.10...13.20  
Del.quantity cm3/ : 10.8...11.0  
100 s: (10.6...11.2)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 325.0  
Rack travel in mm : 4.4...4.6  
Del.quantity cm3/ : 0.7...1.1  
100 s: (0.4...1.3)  
Spread cm3 : 0.3  
100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1360  
travel mm : 6.30...6.70  
2nd speed rpm : 1300  
travel mm : 5.90...6.10  
3rd speed rpm : 450  
travel mm : 3.50...4.10  
4th speed rpm : 325  
travel mm : 1.70...2.10

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: 108  
Speed rpm : 800  
Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1000  
Aneroid pressure h: 1000  
Del.quantity : 108.5...110.5  
1000 : (106.5...112.5)

Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

#### RATED SPEED

1st version  
Control lever  
position degrees: 90...98

#### Setting point:

Speed rpm : 800  
Rack travel in mm : 20.0

#### Testing:

1st rack travel in: 12.10  
Speed rpm : 1345...1360  
2nd rack travel in: 4.00  
Speed rpm : 1445...1475  
4th rack travel in: 1550  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 325  
Rack travel in mm : 4.5

#### Testing:

Speed rpm : 225  
Minimum rack travel: 6.00  
Speed rpm : 325  
Rack travel in mm : 4.40...4.60

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 600  
Pressure hPa : 1000  
Rack travel mm : 13.10...13.20

##### Measurement

Speed 1/min : 600

1st pressure hPa : 500  
Rack travel in m: 12.50...12.60  
2nd pressure hPa : 290  
Rack travel in m: 11.20...11.50  
3rd pressure hPa : -  
Rack travel in m: 10.30...10.50

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 1300

Del.quantity cm<sup>3</sup>/ : 103.0...106.0  
1000 s: (100.5...108.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 63.0...65.0  
1000 s: (61.0...67.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 12.10  
Speed rpm : 1345...1360

#### LOW IDLE

Speed rpm : 325  
Rack travel in mm : 4.40...4.60  
Del.quantity cm<sup>3</sup>/ : 7.0...11.0  
1000 s: (4.5...13.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN 7,3 D  
Edition : 03.12.92  
Replaces : MAN 7,3  
Test oil : ISO-4113

Combination no. : 0 403 456 115

Injection pump  
Pump designation : PES6MW100/321RS1215  
EP type number : 0 413 406 205  
Governor  
Governor design. : RQ250/1200MW84-7  
Governor no. : 0 420 082 055

Customer-spec. information  
Customer : MAN

Engine : D 0826 LUH 01

1st version kW : 199.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.20...14.30

Del.quantity cm3/ : 17.5...17.7

100 s: (17.2...18.0)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 6.8...7.2

Del.quantity cm3/ : 2.8...3.2

100 s: (2.5...3.4)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1320

travel mm : 9.30...9.70

2nd speed rpm : 1255

travel mm : 6.50...6.70

3rd speed rpm : 360

travel mm : 3.90...4.50

4th speed rpm : 250

travel mm : 1.60...2.00

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 19.20...20.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1400

Del.quantity : 175.0...177.0

1000 : (172.0...180.0)

Spread cm3 : 4.00

1000 : (7.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 91...99

### Setting point:

Speed rpm : 600  
Rack travel in mm : 20.0

### Testing:

1st rack travel in: 13.20  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1340...1370  
4th rack travel in: 1450  
Speed rpm : 0.00...1.00

## LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 7.0

### Testing:

Speed rpm : 150  
Minimum rack travel: 8.50  
Speed rpm : 250  
Rack travel in mm : 6.80...7.20

## Aneroid/Altitude Compensator Test

### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 270  
Rack travel mm : 9.30...9.40

### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 9.00...9.10  
2nd pressure hPa : 850  
Rack travel in m: 12.00...12.30  
3rd pressure hPa : 1400  
Rack travel in m: 14.20...14.30

## FUEL DELIVERY CHARACTERISTICS

### 1st version

Aneroid pressure h: 1400  
Speed rpm : 600  
Del.quantity cm3/ : 182.0...186.0  
1000 s: (179.0...189.0)

Spread cm3 : 6.00  
1000 s: (7.0)  
Aneroid pressure h: 1400  
Speed rpm : 800  
Del.quantity cm3/ : 175.0...179.0  
1000 s: (172.0...182.0)  
Aneroid pressure h: 1400  
Speed rpm : 1200  
Del.quantity cm3/ : 170.0...174.0  
1000 s: (167.0...177.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 60.0...62.0  
1000 s: (59.0...64.0)

## BREAKAWAY

### 1st version

1mm rack travel less than  
full load rack tr: 13.20  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 6.80...7.20  
Del.quantity cm3/ : 28.0...32.0  
1000 s: (25.5...34.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

### Remarks:

: MAN #3-7126

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 21.08.92  
Replaces : 06.92  
Test oil : ISO-4113  
Combination no. : 0 403 456 118  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQV250...1200MW83-3  
Governor no. : 0 420 083 280

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF08

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

L07

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 14.8...15.0

100 s: (14.5...15.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250

travel mm : 10.50...10.60

2nd speed rpm : 810

travel mm : 5.90...6.10

3rd speed rpm : 500

travel mm : 3.70...4.30

4th speed rpm : 250

travel mm : 1.20...1.60

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 148.0...150.0

1000 : (145.0...153.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 120...128

Testing:

1st rack travel in: 11.80  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1320...1350  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

CONSTANT REGULATION

Speed rpm : 330...420

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 800  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 1200  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 1000  
Rack travel in m: 13.00...13.20  
4th speed rpm : 600  
Rack travel in m: 13.20...13.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 155  
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 13.20...13.30

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000

L08

Speed rpm : 1200  
Del.quantity cm3/ : 143.0...147.0  
1000 s: (140.0...150.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 144.0...148.0  
1000 s: (141.0...151.0)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 147.0...151.0  
1000 s: (144.0...154.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7218

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 21.08.92  
Replaces : 06.92  
Test oil : ISO-4113  
Combination no. : 0 403 456 119  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-10  
Governor no. : 0 420 082 065

Customer-spec. information  
Customer : MAN

Engine : D0826LF 08/LUH05

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 13.20...13.30

Del.quantity cm3/ : 14.8...15.0

100 s: (14.5...15.3)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.5

100 s: (0.7)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 8.40...8.80

2nd speed rpm : 1260

travel mm : 6.60...6.80

3rd speed rpm : 345

travel mm : 4.00...4.60

4th speed rpm : 250

travel mm : 1.80...2.20

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 107

Speed rpm : 600

Rack travel in mm : 18.20...19.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 148.0...150.0

1000 : (145.0...153.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever  
position degrees: 92...100

Setting point:

Speed rpm : 600  
Rack travel in mm : 19.0

Testing:

1st rack travel in: 11.80  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:

Speed rpm : 100  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 800  
Rack travel in m: 13.20...13.30  
2nd speed rpm : 1200  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 1000  
Rack travel in m: 13.00...13.20  
4th speed rpm : 600  
Rack travel in m: 13.20...13.30

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 155  
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000

L10

Rack travel in m: 13.20...13.30

## FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm<sup>3</sup>/ : 143.0...147.0  
1000 s: (140.0...150.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm<sup>3</sup>/ : 144.0...148.0  
1000 s: (141.0...151.0)  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 147.0...151.0  
1000 s: (144.0...154.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 11.80  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm<sup>3</sup>/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.00)

Remarks:

: MAN #3-7219

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 456 122  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-13  
Governor no. : 0 420 082 068

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF02/LF06

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 600

Rack travel in mm : 15.5

Testing:

1st rack travel in: 11.30

Speed rpm : 1245...1260

2nd rack travel in: 4.00  
Speed rpm : 1300...1330  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

#### Testing:

Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 1000  
Rack travel in m: 12.50...12.70  
4th speed rpm : 1200  
Rack travel in m: 12.20...12.40

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 155  
Rack travel mm : 10.30...10.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 550  
Rack travel in m: 12.00...12.30  
3rd pressure hPa : 1000  
Rack travel in m: 12.70...12.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 138.0...142.0  
1000 s: (135.0...145.0)  
Spread cm3 : 6.00  
1000 s: (7.0)  
Aneroid pressure h: 1000

Speed rpm : 1000  
Del.quantity cm3/ : 137.0...141.0  
1000 s: (134.0...144.0)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 134.0...138.0  
1000 s: (131.0...141.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: MAN #3-7239

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 456 123  
Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RQ250/1200MW84-14  
Governor no. : 0 420 082 069

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF02/LF06

1st version kW : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 15.00...0.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1300

travel mm : 9.30...9.70

2nd speed rpm : 1200

travel mm : 7.20...7.40

3rd speed rpm : 600

travel mm : 6.80...7.20

4th speed rpm : 250

travel mm : 1.60...1.80

## GUIDE SLEEVE POSITION

Control-lever position

Degree: 108

Speed rpm : 600

Rack travel in mm : 14.70...16.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 101...109

Setting point:  
Speed rpm : 600  
Rack travel in mm : 15.5

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 71...79  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 1000  
Rack travel in m: 12.50...12.70  
4th speed rpm : 1200  
Rack travel in m: 12.40...12.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 1000  
Rack travel in m: 12.70...12.90  
2nd pressure hPa : 155  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 550

L14

Rack travel in m: 12.20...12.50

## FUEL DELIVERY CHARACTERISTICS

1st version  
Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 136.0...140.0  
1000 s: (133.0...143.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 137.0...141.0  
1000 s: (134.0...144.0)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 135.0...139.0  
1000 s: (132.0...142.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

## BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 11.40  
Speed rpm : 1245...1260

## STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

## LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:  
: MAN #3-7240

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113

Combination no. : 0 403 456 124

Injection pump  
Pump designation : PES6MW100/321RS1201  
EP type number : 0 413 406 190  
Governor  
Governor design. : RGV250...975/1200MW1  
28  
Governor no. : 0 420 083 288

Customer-spec. information  
Customer : MAN

Engine : D 0826 LF08

1st version kw : 169.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 15.00...0.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.80...12.90

Del.quantity cm3/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
travel mm : 11.00...11.20

2nd speed rpm : 1050  
travel mm : 9.30...9.70

3rd speed rpm : 650  
travel mm : 4.20...4.80

4th speed rpm : 350  
travel mm : 2.10...2.50

5th speed rpm : 250  
travel mm : 1.20...1.40

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del.quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever  
position degrees: 123...131

Testing:  
1st rack travel in: 11.40  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1295...1325  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1  
Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:  
Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL  
Dimension a mm : 0.40  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 12.80...12.90  
2nd speed rpm : 600  
Rack travel in m: 12.70...12.90  
3rd speed rpm : 1000  
Rack travel in m: 12.50...12.70  
4th speed rpm : 1200  
Rack travel in m: 12.40...12.60

Aneroid/Altitude  
Compensator Test

1st version  
Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.30...10.40

Measurement  
Speed 1/min : 500

1st pressure hPa : 1000  
Rack travel in m: 12.70...12.90  
2nd pressure hPa : 155  
Rack travel in m: 10.60...10.70  
3rd pressure hPa : 550  
Rack travel in m: 12.20...12.50

#### FUEL DELIVERY CHARACTERISTICS

1st version

L16

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 136.0...140.0  
1000 s: (133.0...143.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 137.0...141.0  
1000 s: (134.0...144.0)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 135.0...139.0  
1000 s: (132.0...142.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.40  
Speed rpm : 1245...1260

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

#### LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN #3-7253

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MAN  
 Edition : 25.09.92  
 Replaces : -  
 Test oil : ISO-4113  
 Combination no. : 0 403 456 125  
 Injection pump  
 Pump designation : PES6MW100/321RS1201  
 EP type number : 0 413 406 190  
 Governor  
 Governor design. : RQV250...975/1200MW1  
 28-1  
 Governor no. : 0 420 083 289

Customer-spec. information  
 Customer : MAN

Engine : D 0826 LF02

1st version kW : 169.0  
 Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 800

Rack travel in mm : 12.30...12.50

Del. quantity cm3/ : 14.1...14.3

100 s: (13.8...14.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 250.0

Rack travel in mm : 5.4...5.6

Del. quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

(B) Setting of injection pump  
 with governor

## GUIDE SLEEVE TRAVEL

1st speed rpm : 1250  
 travel mm : 11.00...11.20

2nd speed rpm : 1050  
 travel mm : 9.30...9.70

3rd speed rpm : 650  
 travel mm : 4.20...4.80

4th speed rpm : 350  
 travel mm : 2.10...2.50

5th speed rpm : 250  
 travel mm : 1.20...1.40

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 800

Aneroid pressure h: 1000

Del. quantity : 141.0...143.0

1000 : (138.0...146.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever  
position degrees: 118...126

Testing:

1st rack travel in: 11.30  
Speed rpm : 1245...1260  
2nd rack travel in: 4.00  
Speed rpm : 1285...1315  
4th rack travel in: 1400  
Speed rpm : 0.00...1.00

LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 250  
Rack travel in mm : 5.5

Testing:

Speed rpm : 150  
Minimum rack travel: 7.00  
Speed rpm : 250  
Rack travel in mm : 5.40...5.60

TORQUE CONTROL

Dimension a mm : 0.50  
Torque control curve - 1st version  
1st speed rpm : 800  
Rack travel in m: 12.30...12.50  
2nd speed rpm : 600  
Rack travel in m: 12.60...12.80  
3rd speed rpm : 1000  
Rack travel in m: 12.20...12.40  
4th speed rpm : 1200  
Rack travel in m: 12.20...12.40

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 155  
Rack travel mm : 10.30...10.40

Measurement

Speed 1/min : 500

1st pressure hPa : -  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 550  
Rack travel in m: 11.90...12.20  
3rd pressure hPa : 1000  
Rack travel in m: 12.70...12.90

FUEL DELIVERY CHARACTERISTICS

1st version

L18

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm3/ : 139.0...143.0  
1000 s: (136.0...146.0)  
Spread cm3 : 6.00  
1000 s: (9.0)  
Aneroid pressure h: 1000  
Speed rpm : 1000  
Del.quantity cm3/ : 149.0...143.0  
1000 s: (136.0...146.0)  
Aneroid pressure h: 1000  
Speed rpm : 1200  
Del.quantity cm3/ : 136.5...140.5  
1000 s: (133.5...143.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 74.0...76.0  
1000 s: (72.0...78.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.30  
Speed rpm : 1245...1260

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 60.0...80.0  
1000 s: (57.0...83.0)

LOW IDLE

Speed rpm : 250  
Rack travel in mm : 5.40...5.60  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

: MAN 3-7197

Start-of-delivery mark is at start of  
delivery of cylinder 1

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM 8,3 N  
Edition : 27.11.92  
Replaces : 09.91  
Test oil : ISO-4113

Combination no. : 0 403 466 121

Injection pump  
Pump designation : PES6MW100/120RS1184  
EP type number : 0 413 406 171  
Governor  
Governor design. : RSV375...1250MW2A334  
Governor no. : 0 420 085 122

Customer-spec. information  
Customer : CUMMINS

Engine : 6 BTAA 5.9

1st version kW : 157.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 017

Opening  
pressure, bar : 207...210

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1250

Rack travel in mm : 10.80...10.90

Del.quantity cm3/ : 12.5...12.7

100 s: (12.3...12.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 375.0

Rack travel in mm : 6.5...7.0

Del.quantity cm3/ : 1.6...2.0

100 s: (1.3...2.2)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1250

Aneroid pressure h: 800

Del.quantity : 125.0...127.0

1000 : (123.0...129.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 102...110

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.80

Speed rpm : 1295...1305

2nd rack travel in: 4.00  
Speed rpm : 1370...1400  
3rd rack travel in: 4.00  
Speed rpm : 1415...1445  
4th rack travel in: 1470  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 78...86  
Setting point w/out bumper spring  
Speed rpm : 375  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 375  
Rack travel in mm : 5.50...6.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.70...9.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 490  
Rack travel in m: 10.20...10.30  
2nd pressure hPa : 550  
Rack travel in m: 10.40...10.70  
3rd pressure hPa : 800  
Rack travel in m: 10.80...10.90

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 80.0...82.0  
1000 s: (78.0...84.0)  
Spread cm3 : 5.00  
1000 s: (7.00)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.80  
Speed rpm : 1295...1305

#### STARTING FUEL DELIVERY

L20

Speed rpm : 100  
Del.quantity cm3/ : 73.0...83.0  
1000 s: (70.0...86.0)

#### LOW IDLE

Speed rpm : 375  
Rack travel in mm : 6.50...7.00  
Del.quantity cm3/ : 16.0...20.0  
1000 s: (13.5...22.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

#### Remarks:

: CUM #3280646

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : CUM  
Edition : 27.11.92  
Replaces : 07.92  
Test oil : ISO-4113

Combination no. : 0 403 466 130

Injection pump  
Pump designation : PES6MW100/120RS1137-  
2

EP type number : 0 413 406 180  
Governor  
Governor design. : RSV550...1100MW2A335  
-4  
Governor no. : 0 420 085 206

Customer-spec. information  
Customer : CUMMINS

Engine : 6 CTA

1st version kW : 179.0  
Rated speed : 2200

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 417 413 047

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 1 688 901 101

Opening  
pressure, bar : 207...210

Orifice plate  
diameter mm : 0,6

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)  
Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Phasing :  
Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1100  
Rack travel in mm : 14.50...14.60  
Del.quantity cm3/ : 15.4...15.6  
100 s: (15.1...15.9)  
Spread cm3 : 0.4  
100 s: (0.7)

2nd speed rpm : 550.0  
Rack travel in mm : 6.5...7.0  
Del.quantity cm3/ : 1.8...2.2  
100 s: (1.6...2.5)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1100  
Aneroid pressure h: 900  
Del.quantity : 154.0...156.0  
1000 : (151.0...159.0)  
Spread cm3 : 4.00  
1000 : (7.50)

## RATED SPEED

1st version  
Control lever  
position degrees: 93...101

Setting point:

Speed rpm : 800  
Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.50  
Speed rpm : 1165...1175  
2nd rack travel in: 4.00  
Speed rpm : 1240...1250  
3rd rack travel in: 4.00  
Speed rpm : 1240...1270  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 550  
Rack travel in mm : 6.2

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 550  
Rack travel in mm : 6.00...6.50

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 14.50...14.60

Measurement

Speed 1/min : 500  
Rack travel in m: 11.40...11.60  
2nd pressure hPa : 400  
Rack travel in m: 12.30...12.40  
3rd pressure hPa : 630  
Rack travel in m: 13.80...14.20

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 98.0...100.0  
1000 s: (96.0...102.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 13.50  
Speed rpm : 1165...1175

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...150.0  
1000 s: (127.0...153.0)  
Rack travel in mm : 19.00...21.00

LOW IDLE

Speed rpm : 550  
Rack travel in mm : 6.50...7.00  
Del.quantity cm<sup>3</sup>/ : 18.5...22.5  
1000 s: (16.0...25.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

: CUM #3925266

Start-of-delivery mark 9° cam angle  
after start of delivery cyl. 1.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 5,6 B  
Edition : 23.10.92  
Replaces : 04.92  
Test oil : ISO-4113

Combination no. : 0 403 474 008

Injection pump  
Pump designation : PES4MW100/720RS1181  
EP type number : 0 413 404 107  
Governor  
Governor design. : RSV400...1000MW1A333  
Governor no. : 0 420 085 118

Customer-spec. information  
Customer : LIEBHERR

Engine : 914

1st version kw : 120.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 12.10...12.20

Del.quantity cm3/ : 15.1...15.3

100 s: (14.8...15.6)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0

Rack travel in mm : 6.1...6.3

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980

Del.quantity : 151.0...153.0

1000 : (148.0...156.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.10  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1050...1080  
4th rack travel in: 1175  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 980  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.20  
5th speed rpm : 450  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 152.0...156.0  
1000 s: (149.0...159.0)  
Spread cm<sup>3</sup> : 6.00  
1000 s: (9.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1020...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.10...6.30  
Del.quantity cm<sup>3</sup>/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 23.10.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 474 008A  
Injection pump  
Pump designation : PES4MW100/720RS1181  
EP type number : 0 413 404 107  
Governor  
Governor design. : RSV400...1000MW1A333  
Governor no. : 0 420 085 118

Customer-spec. information  
Customer : LIEBHERR

Engine : 914

1st version kW : 120.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 980

Rack travel in mm : 12.10...12.20

Del. quantity cm3/ : 15.1...15.3

100 s: (15.1...15.7)

Spread cm3 : 0.4

100 s: (0.7)

2nd speed rpm : 400.0  
Rack travel in mm : 6.1...6.3  
Del. quantity cm3/ : 2.0...2.4  
100 s: (1.7...2.6)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 3.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 980

Del. quantity : 151.0...153.0

1000 : (151.0...157.0)

Spread cm3 : 4.00

1000 : (7.50)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.10  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1050...1060  
4th rack travel in: 1175  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.60...5.80  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 980  
Rack travel in m: 12.10...12.20  
2nd speed rpm : 600  
Rack travel in m: 12.10...12.20  
5th speed rpm : 450  
Rack travel in m: 13.00...13.20

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm3/ : 152.0...156.0  
1000 s: (149.0...159.0)  
Spread cm3 : 6.00  
1000 s: (9.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 11.10  
Speed rpm : 1020...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.10...6.30  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 21.08.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 474 0080  
Injection pump  
Pump designation : PES4MW100/72ORS1181  
EP type number : 0 413 404 107  
Governor  
Governor design. : RSV400...1000MW1A333  
Governor no. : 0 420 085 118

Customer-spec. information  
Customer : LIEBHERR

Engine : D914TI

1st version kW : 100.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.90...11.10

Del.quantity cm3/ : 13.5...13.7

100 s: (13.3...13.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.3...5.8

Del.quantity cm3/ : 1.7...2.1

100 s: (1.4...2.3)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 135.0...137.0

1000 : (133.0...139.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90  
Speed rpm : 920...930  
2nd rack travel in: 4.00  
Speed rpm : 960...975  
3rd rack travel in: 4.00  
Speed rpm : 975...990  
4th rack travel in: 1075  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 69...77  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 4.80...5.30  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 128.0...131.0  
1000 s: (125.5...133.5)  
Spread cm3 : 3.50  
1000 s: (7.0)  
Speed rpm : 700  
Del.quantity cm3/ : 136.0...139.0  
1000 s: (133.5...141.5)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 920...930

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.30...5.80  
Del.quantity cm3/ : 17.0...21.0  
1000 s: (14.5...23.5)

Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 21.08.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 474 008E  
  
Injection pump  
Pump designation : PES4MW100/720RS1181  
EP type number : 0 413 404 107  
Governor  
Governor design. : RSV400...1000MW1A333  
Governor no. : 0 420 085 118

Customer-spec. information  
Customer : LIEBHERR

Engine : D914T

1st version kW : 100.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00

MD1

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.90

Del.quantity cm3/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 5.5...6.0

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 130.0...132.0

1000 : (128.0...134.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 95...103

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.70  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1060...1075  
3rd rack travel in: 4.00  
Speed rpm : 1070...1085  
4th rack travel in: 1175  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.2

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.00...5.50  
Rack travel in mm : 2.00  
Speed rpm : 480...540

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 500  
Del.quantity cm3/ : 126.5...129.5  
1000 s: (124.0...132.0)  
Spread cm3 : 3.50  
1000 s: (7.0)  
Speed rpm : 800  
Del.quantity cm3/ : 133.5...136.5  
1000 s: (131.0...139.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1020...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 5.50...6.00  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)

Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 21.08.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 474 008F  
Injection pump  
Pump designation : PES4MW100/720RS1181  
EP type number : 0 413 404 107  
Governor  
Governor design. : RSV400...1000MW1A333  
Governor no. : 0 420 085 118

Customer-spec. information  
Customer : LIEBHERR

Engine : D914T

1st version kW : 100.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)

Rack travel in mm : 9.00...12.00

MO3

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 900

Rack travel in mm : 10.70...10.90

Del.quantity cm3/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 500.0

Rack travel in mm : 4.5...5.0

Del.quantity cm3/ : 2.4...2.8

100 s: (2.1...3.0)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 900

Del.quantity : 130.0...132.0

1000 : (128.0...134.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 90...98

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.70  
Speed rpm : 920...930  
2nd rack travel in: 4.00  
Speed rpm : 960...975  
3rd rack travel in: 4.00  
Speed rpm : 975...990  
4th rack travel in: 1075  
Speed rpm : 0.30...1.70

Remarks:

LOW IDLE 1  
Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 500  
Rack travel in mm : 4.2

Testing:  
Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 500  
Rack travel in mm : 4.00...4.50

#### FUEL DELIVERY CHARACTERISTICS

1st version  
Speed rpm : 500  
Del.quantity cm3/ : 126.5...129.5  
1000 s: (124.0...132.0)  
Spread cm3 : 3.50  
1000 s: (7.0)  
Speed rpm : 700  
Del.quantity cm3/ : 133.5...136.5  
1000 s: (131.0...139.0)

#### BREAKAWAY

1st version  
1mm rack travel less than  
full load rack tr: 9.70  
Speed rpm : 920...930

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 500  
Rack travel in mm : 4.50...5.00  
Del.quantity cm3/ : 24.0...28.0  
1000 s: (21.5...30.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

M04

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4.0 A 32  
 Edition : 21.08.92  
 Replaces : 12.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 474 010  
 Injection pump  
 Pump designation : PES4MW100/720RS1127  
 EP type number : 0 413 404 103  
 Governor  
 Governor design. : RSV350...750MWOA336-  
 5  
 Governor no. : 0 420 085 164

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM364A

1st version kW : 84.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00x2.50x600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

MO5

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 13.80...13.90

Del. quantity cm<sup>3</sup>/ : 9.5...9.7

100 s: (9.3...9.9)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 7.3...7.9

Del. quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del. quantity : 95.0...97.0

1000 : (93.0...99.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 76...84

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.80

Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 788...793  
4th rack travel in: 350  
Speed rpm : 0.30...1.40

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 7.6  
Speed rpm : 350  
Rack travel in mm : 7.30...7.90

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 12.80  
Speed rpm : 750...755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 90.0...100.0  
1000 s: (87.0...103.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.30...7.90  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

See VDT-I-401/102.

\* Read off speed set under 1.  
Add 30...38 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 21.08.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 474 012A  
  
Injection pump  
Pump designation : PES4MW100/720RS1207  
EP type number : 0 413 404 113  
Governor  
Governor design. : RSV350...1000MWOA333  
-1  
Governor no. : 0 420 085 153

Customer-spec. information  
Customer : LIEBHERR

Engine : D 914 T

1st version kW : 110.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00x2.00x600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.30...3.40  
: (3.25...3.45)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s: (13.1...13.7)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.4...6.6

Del.quantity cm<sup>3</sup>/ : 1.4...1.8

100 s: (1.1...2.0)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Del.quantity : 133.0...135.0

1000 : (131.0...137.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50  
Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1110...1140  
4th rack travel in: 1275  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Rack travel in mm : 2.00  
Speed rpm : 390...450

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1000  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 700  
Rack travel in m: 11.50...11.60  
3rd speed rpm : 500  
Rack travel in m: 11.50...11.60  
5th speed rpm : 400  
Rack travel in m: 13.00...13.10

FUEL DELIVERY CHARACTERISTICS

1st version

Speed rpm : 700  
Del.quantity cm3/ : 132.0...135.0  
1000 s: (129.5...137.5)  
Spread cm3 : 3.50  
1000 s: (7.0)

BREAKAWAY

1st version

1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1040...1050

STARTING FUEL DELIVERY

Speed rpm : 100

MO8

Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.50...21.00

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.40...6.60  
Del.quantity cm3/ : 14.0...18.0  
1000 s: (11.5...20.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 J  
Edition : 21.08.92  
Replaces : 12.91  
Test oil : ISO-4113  
Combination no. : 0 403 474 013  
Injection pump  
Pump designation : PES4MW100/720RS1127  
EP type number : 0 413 404 103  
Governor  
Governor design. : RSV750...1250MWA318  
-8  
Governor no. : 0 420 085 167

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 364 A

1st version kW : 84.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

BEGINNING OF DELIVERY  
Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 12.40...12.50

Del.quantity cm3/ : 8.4...8.6

100 s: (8.2...8.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 750.0  
Rack travel in mm : 6.3...6.9  
Del.quantity cm3/ : 0.9...1.3  
100 s: (0.6...1.5)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 2.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1230  
Del.quantity : 84.0...86.0  
1000 : (82.0...88.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 88...96

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 11.40

Speed rpm : 1270...1275 \*  
2nd rack travel in: 4.00  
Speed rpm : 1295...1310  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 6.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 750  
Rack travel in mm : 6.30...6.90  
Rack travel in mm : 2.00  
Speed rpm : 750...810

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm<sup>3</sup>/ : 73.0...76.0  
1000 s: (70.5...78.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### RACK STOP ADJUSTMENT

Speed rpm : 100

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 83.0...93.0  
1000 s: (80.0...96.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 6.30...6.90  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

\* Read off speed set under 1.  
Add 25...35 min<sup>-1</sup> to this speed. The

M10

control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 4,0 H 7  
Edition : 30.10.92  
Replaces : 02.92  
Test oil : ISO-4113

Combination no. : 0 403 474 019

Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RSV350...1200MWOA346  
-3

Governer no. : 0 420 085 179

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 364 A

1st version kW : 77.0  
Rated speed : 2400

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1200

Rack travel in mm : 11.50...11.60

Del.quantity cm<sup>3</sup>/ : 8.8...9.0

100 s: (8.6...9.2)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.8

Del.quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1200

Aneroid pressure h: 700

Del.quantity : 88.0...90.0

1000 : (86.0...92.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50  
Speed rpm : 1240...1245 +  
2nd rack travel in: 4.00  
Speed rpm : 1235...1298  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

##### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1200  
Rack travel in m: 11.50...11.60  
2nd speed rpm : 600  
Rack travel in m: 12.30...12.50  
3rd speed rpm : 1000  
Rack travel in m: 11.90...12.10

#### Aneroid/Altitude Compensator Test

##### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.90...10.00

##### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.40...10.50  
2nd pressure hPa : 375  
Rack travel in m: 11.50...11.80  
3rd pressure hPa : 700  
Rack travel in m: 12.30...12.50

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Aneroid pressure h: 700  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 83.5...86.5  
1000 s: (81.0...89.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 49.0...51.0  
1000 s: (47.0...53.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 75.0...85.0  
1000 s: (72.0...88.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

:

\* Read off speed set under 1.  
Add 45...53 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Set pneumatic shutoff device to  
control-rod stop = 0.5...1.5 mm  
control-rod travel at 4.5 bar  
atmospheric pressure.

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 21.08.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 474 021A  
Injection pump  
Pump designation : PES4MW100/72ORS1181  
EP type number : 0 413 404 107  
Governor  
Governor design. : RSV400...1000MW1A348  
Governor no. : 0 420 085 183

Customer-spec. information  
Customer : LIEBHERR

Engine : D914T

1st version kW : 100.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 9.00...12.00

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

Time to cyl. no. : 1

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 10.70...10.90

Del.quantity cm3/ : 13.0...13.2

100 s: (12.8...13.4)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 400.0

Rack travel in mm : 6.0...6.5

Del.quantity cm3/ : 2.0...2.4

100 s: (1.7...2.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1000

Del.quantity : 130.0...132.0

1000 : (128.0...134.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 104...112

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:  
1st rack travel in: 9.70  
Speed rpm : 1020...1030  
2nd rack travel in: 4.00  
Speed rpm : 1060...1075  
3rd rack travel in: 4.00  
Speed rpm : 1070...1085  
4th rack travel in: 1200  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 76...84  
Setting point w/out bumper spring  
Speed rpm : 400  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 400  
Rack travel in mm : 5.50...6.00  
Rack travel in mm : 2.00  
Speed rpm : 450...510

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1000  
Rack travel in m: 10.70...10.90  
2nd speed rpm : 500  
Rack travel in m: 10.70...10.90  
5th speed rpm : 450  
Rack travel in m: 11.90...12.10

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.20...10.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : 530  
Rack travel in m: 10.50...10.60  
2nd pressure hPa : 1000  
Rack travel in m: 10.70...10.90

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 500  
Del.quantity cm3/ : 123.5...126.5  
1000 s: (121.0...129.0)

Spread cm3 : 3.50  
1000 s: (7.0)  
Aneroid pressure h: 1000  
Speed rpm : 800  
Del.quantity cm3/ : 130.0...133.0  
1000 s: (127.5...135.5)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 109.0...111.0  
1000 s: (107.0...113.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.70  
Speed rpm : 1020...1030

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 130.0...140.0  
1000 s: (127.0...143.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 400  
Rack travel in mm : 6.00...6.50  
Del.quantity cm3/ : 20.0...24.0  
1000 s: (17.5...26.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB  
Edition : 05.10.92  
Replaces : 03.92  
Test oil : ISO-4113

Combination no. : 0 403 474 022

Injection pump  
Pump designation : PES4MW100/720RS1151  
EP type number : 0 413 404 104  
Governor  
Governor design. : RSV350...1300MWOA329  
-12  
Governor no. : 0 420 085 189

Customer-spec. information  
Customer : MB-NFZ

Engine : OM364A

1st version kW : 79.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 10.90...11.00

Del. quantity cm<sup>3</sup>/ : 8.2...8.4

100 s: (8.0...8.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.8

Del. quantity cm<sup>3</sup>/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 6.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 700

Del. quantity : 82.0...84.0

1000 : (80.0...86.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 95...103

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90  
Speed rpm : 1330...1335 \*  
2nd rack travel in: 4.00  
Speed rpm : 1410...1423  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.80

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Dimension a mm : 0.80  
Torque control curve - 1st version  
1st speed rpm : 1280  
Rack travel in m: 10.90...11.00  
2nd speed rpm : 600  
Rack travel in m: 11.80...11.90  
3rd speed rpm : 1000  
Rack travel in m: 11.70...11.90  
4th speed rpm : 1175  
Rack travel in m: 11.00...11.30

#### Aneroid/Altitude Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.80...10.00

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 10.70...10.90  
2nd pressure hPa : 300  
Rack travel in m: 11.20...11.40  
3rd pressure hPa : 700  
Rack travel in m: 11.70...11.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 700  
Speed rpm : 600

Del.quantity cm<sup>3</sup>/ : 75.0...78.0  
1000 s: (72.5...80.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1330...1335

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.80  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

#### Remarks:

Test hydr. locking device for starting  
with 800...1200 hPa air pressure.

\* Read off speed set under 1.  
Add 80...88 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : VME  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113  
  
Combination no. : 0 403 474 024  
  
Injection pump  
Pump designation : PES4MW100/320RS1223  
EP type number : 0 413 404 119  
Governor  
Governor design. : RSV300...1000MW1A351  
Governor no. : 0 420 085 204

Customer-spec. information  
Customer : VME

Engine : TD45E

1st version kW : 84.0  
Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 014

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.00...3.10  
: (2.95...3.15)  
Rack travel in mm : 12.50...13.50

Firing order : 1- 3- 4- 2

Phasing : 0-90-180-270

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1000

Rack travel in mm : 14.60...14.70

Del.quantity cm<sup>3</sup>/ : 13.3...13.5

100 s: (13.0...13.8)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 300.0

Rack travel in mm : 4.6...5.0

Del.quantity cm<sup>3</sup>/ : 1.8...2.2

100 s: (1.5...2.4)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1000

Aneroid pressure h: 1200

Del.quantity : 133.0...135.0

1000 : (130.0...138.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 102...110

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.60

Speed rpm : 1040...1050  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
3rd rack travel in: 4.00  
Speed rpm : 1120...1150  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 300  
Rack travel in mm : 4.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 300  
Rack travel in mm : 4.10...4.50

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Rack travel mm : 12.20...12.40

#### Measurement

Speed 1/min : 550

1st pressure hPa : 255  
Rack travel in m: 12.6...12.7  
2nd pressure hPa : 520  
Rack travel in m: 13.9...14.1  
3rd pressure hPa : 800  
Rack travel in m: 14.0...14.2  
4th pressure hPa : 960  
Rack travel in m: 14.3...14.5  
5th pressure hPa : 1200  
Rack travel in m: 14.6...14.7

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 84.0...86.0  
1000 s: (82.0...88.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.60

M18

Speed rpm : 1040...1050

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 140.0...160.0  
1000 s: (137.0...163.0)  
Rack travel in mm : 19.00...21.00

#### LOW IDLE

Speed rpm : 300  
Rack travel in mm : 4.60...5.00  
Del.quantity cm3/ : 18.0...22.0  
1000 s: (15.5...24.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 41  
Edition : 21.08.92  
Replaces : 05.88  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 037  
  
Injection pump  
Pump designation : PES6MW100/720RS1130  
EP type number : 0 413 406 122  
Governor  
Governor design. : RSV350...1300MW0A318  
Governor no. : 0 420 085 052

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 125.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00

Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.00...11.10

Del.quantity cm<sup>3</sup>/ : 7.7...7.9

100 s: (7.5...8.1)

Spread cm<sup>3</sup> : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.0...8.2

Del.quantity cm<sup>3</sup>/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm<sup>3</sup> : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

### 1st version

Speed rpm : 1280

Del.quantity : 77.0...79.0

1000 : (75.0...81.0)

Spread cm<sup>3</sup> : 3.50

1000 : (6.00)

## RATED SPEED

### 1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

## Testing:

1st rack travel in: 10.00

Speed rpm : 1320...1330

2nd rack travel in: 4.00

Speed rpm : 1380...1410

4th rack travel in: 1560

Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever

position degrees: 75...83

Setting point w/out bumper spring

Speed rpm : 350

Rack travel in mm : 8.1

#### Testing:

Speed rpm : 100

Minimum rack travel: 19.00

Speed rpm : 350

Rack travel in mm : 8.00...8.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### TORQUE CONTROL

Torque control curve - 1st version

1st speed rpm : 1280

Rack travel in m: 11.00...11.20

2nd speed rpm : 750

Rack travel in m: 11.70...11.80

3rd speed rpm : 825

Rack travel in m: 11.40...11.60

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750

Del.quantity cm3/ : 72.0...74.0

1000 s: (70.0...76.0)

Spread cm3 : 5.00

1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.00

Speed rpm : 1320...1330

#### STARTING FUEL DELIVERY

Speed rpm : 100

Del.quantity cm3/ : 78.0...88.0

1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350

Rack travel in mm : 8.00...8.20

Del.quantity cm3/ : 9.0...13.0

1000 s: (7.0...15.0)

Spread cm3 : 3.50

1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 d 6  
Edition : 21.08.92  
Replaces : 05.88  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 041  
  
Injection pump  
Pump designation : PES6MW100/720RS1129  
EP type number : 0 413 406 121  
Governor  
Governor design. : RSV350...750MWA318-  
2  
Governor no. : 0 420 085 056

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 94.0  
Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
  
Overflow valve : 1 419 992 198  
  
Inlet press., bar : 1.50  
  
Test nozzle holder  
assembly : 0 681 343 009  
  
Opening  
pressure, bar : 172...175  
  
Test lines : 1 680 750 089  
  
Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
  
Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700  
  
Rack travel in mm : 12.50...12.60  
  
Del. quantity cm<sup>3</sup>/ : 8.5...8.7  
100 s: (8.3...8.9)  
  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.6)  
  
2nd speed rpm : 350.0  
Rack travel in mm : 6.1...6.2  
Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
100 s: (0.7...1.5)  
Spread cm<sup>3</sup> : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 700  
Del. quantity : 85.0...87.0  
1000 : (83.0...89.0)  
Spread cm<sup>3</sup> : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 74...82

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 11.5  
Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 775...788

4th rack travel in: 820  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 60...68  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.10...6.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.5  
Speed rpm : 750...755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.10...6.20  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 25...33 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 57  
 Edition : 21.08.92  
 Replaces : 02.89  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 059  
 Injection pump  
 Pump designation : PES6MW100/720RS1130  
 EP type number : 0 413 406 122  
 Governor  
 Governor design. : RSV750...1250MWOA325  
 -1  
 Governor no. : 0 420 085 112

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 125.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 10.90...11.00

Del.quantity cm3/ : 7.8...8.0

100 s: (7.6...8.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 750.0

Rack travel in mm : 5.6...5.7

Del.quantity cm3/ : 0.9...1.3

100 s: (0.7...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1230

Del.quantity : 78.0...80.0

1000 : (76.0...82.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 9.90

Speed rpm : 1270...1275 \*

2nd rack travel in: 4.00

Speed rpm : 1295...1340

4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 750  
Rack travel in mm : 5.60...5.70

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 55.0...59.0  
1000 s: (53.0...61.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 9.90  
Speed rpm : 1270...1275

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 5.60...5.70  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 39  
Edition : 21.08.92  
Replaces : 08.90  
Test oil : ISO-4113  
Combination no. : 0 403 476 062  
Injection pump  
Pump designation : PES6MW100/720RS1172  
EP type number : 0 413 406 155  
Governor  
Governor design. : RSV350...1300MWA329  
-1  
Governor no. : 0 420 085 091

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 169.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve  
: 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 19.00...21.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.40...14.50

Del.quantity cm3/ : 10.5...10.7

100 s: (10.3...10.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 105.0...107.0

1000 : (103.0...109.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.40

Speed rpm : 1320...1330

2nd rack travel in: 4.00

Speed rpm : 1395...1425  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.70...10.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 11.90...12.10  
2nd pressure hPa : 650  
Rack travel in m: 13.40...13.60  
3rd pressure hPa : 1000  
Rack travel in m: 14.40...14.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 900  
Del.quantity cm3/ : 98.0...101.0  
1000 s: (95.5...103.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 31.0...33.0  
1000 s: (29.0...35.0)  
Spread cm3 : 3.50  
1000 s: (6.00)

#### BREAKAWAY

M26

#### 1st version

1mm rack travel less than

full load rack tr: 13.40  
Speed rpm : 1320...1330

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 90.0...100.0  
1000 s: (87.0...103.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 5,7 A 18  
Edition : 21.08.92  
Replaces : 09.88  
Test oil : ISO-4113  
  
Combination no. : 0 403 476 063  
  
Injection pump  
Pump designation : PES6MW100/72ORS1125  
EP type number : 0 413 406 119  
Governor  
Governor design. : RSV350...1300MWOA329  
-3  
Governor no. : 0 420 085 094

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 362 LA

1st version kW : 134.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.20...3.30  
: (3.15...3.35)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.80...11.90

Del.quantity cm3/ : 9.6...9.8

100 s: (9.4...10.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.0

Del.quantity cm3/ : 1.1...1.5

100 s: (0.9...1.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 900

Del.quantity : 96.0...98.0

1000 : (94.0...100.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.80

Speed rpm : 1330...1340

2nd rack travel in: 4.00

Speed rpm : 1400...1430  
4th rack travel in: 1560  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.9

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.00

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : 900  
Rack travel mm : 11.80...11.90

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 450  
Rack travel in m: 11.30...11.60  
3rd pressure hPa : -  
Rack travel in m: 9.70...9.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 800  
Del.quantity cm3/ : 88.5...91.5  
1000 s: (86.0...94.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 46.0...48.0  
1000 s: (44.0...50.0)

#### BREAKAWAY

#### 1st version

M28

1mm rack travel less than

full load rack tr: 10.80  
Speed rpm : 1330...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.00  
Del.quantity cm3/ : 11.0...15.0  
1000 s: (9.0...17.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 49  
 Edition : 21.08.92  
 Replaces : 08.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 064  
 Injection pump  
 Pump designation : PES6MW100/720RS1129  
 FP type number : 0 413 406 121  
 Governor  
 Governor design. : RSV350...1300MWA329  
 -2  
 Governor no. : 0 420 085 095

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 150.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 11.50...11.60

Del.quantity cm3/ : 9.7...9.9

100 s: (9.5...10.1)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.5...5.7

Del.quantity cm3/ : 0.8...1.2

100 s: (0.6...1.4)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 900

Del.quantity : 97.0...99.0

1000 : (95.0...101.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 106...114

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.50

Speed rpm : 1320...1330

2nd rack travel in: 4.00

Speed rpm : 1385...1415  
4th rack travel in: 1450  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.50...5.70

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.50...9.60

#### Measurement

Speed 1/min : 500

1st pressure hPa : 175  
Rack travel in m: 10.00...10.10  
2nd pressure hPa : 300  
Rack travel in m: 10.80...11.10  
3rd pressure hPa : 900  
Rack travel in m: 11.50...11.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 900  
Speed rpm : 750  
Del.quantity cm3/ : 86.5...89.5  
1000 s: (84.0...92.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

#### 1st version

N02

1mm rack travel less than

full load rack tr: 10.50  
Speed rpm : 1320...1330

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.50...5.70  
Del.quantity cm3/ : 8.0...12.0  
1000 s: (6.0...14.0)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 52  
Edition : 21.08.92  
Replaces : 02.89  
Test oil : ISO-4113  
Combination no. : 0 403 476 066  
Injection pump  
Pump designation : PES6MW100/720RS1130  
EP type number : 0 413 406 122  
Governor  
Governor design. : RSV350...1300MWOA318  
-5  
Governor no. : 0 420 085 100

Customer spec. information  
Customer : MB-NFZ

Engine : OM 366 A

1st version kW : 130.0  
Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42  
Overflow valve : 1 419 992 198  
Inlet press., bar : 1.50  
Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32  
Prestroke mm : 3.70...3.80  
: (3.65...3.85)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280  
Rack travel in mm : 11.00...11.10  
Del. quantity cm3/ : 8.1...8.3  
100 s: (7.9...8.5)  
Spread cm3 : 0.3  
100 s: (0.6)

2nd speed rpm : 350.0  
Rack travel in mm : 7.9...8.1  
Del. quantity cm3/ : 0.9...1.3  
100 s: (0.7...1.5)  
Spread cm3 : 0.3  
100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
Degree: -3  
Speed rpm : 800  
Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
Speed rpm : 1280  
Del. quantity : 81.0...83.0  
1000 : (79.0...85.0)  
Spread cm3 : 3.50  
1000 : (6.00)

## RATED SPEED

1st version  
Control lever  
position degrees: 105...113

Setting point:  
Speed rpm : 800  
Rack travel in mm : 0.6

Testing:  
1st rack travel in: 10.00

Speed rpm : 1330...1340  
2nd rack travel in: 4.00  
Speed rpm : 1400...1430  
4th rack travel in: 1560  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 8.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 7.90...8.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del. quantity cm<sup>3</sup>/ : 68.0...71.0  
1000 s: (65.5...73.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 10.00  
Speed rpm : 1330...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 78.0...88.0  
1000 s: (75.0...91.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 7.90...8.10  
Del. quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (7.0...15.0)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 60  
 Edition : 21.08.92  
 Replaces : 03.89  
 Test oil : ISO-4113

Combination no. : 0 403 476 069

Injection pump  
 Pump designation : PES6MW100/720RS1129  
 EP type number : 0 413 406 121  
 Governor  
 Governor design. : RSV750...1250MWOA325  
 -2  
 Governor no. : 0 420 085 115

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 146.0  
 Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

N05

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1230

---

Rack travel in mm : 11.50...11.60

---

Del.quantity cm3/ : 9.7...9.9

---

100 s: (9.5...10.1)

---

Spread cm3 : 0.3

---

100 s: (0.6)

---

2nd speed rpm : 750.0  
 Rack travel in mm : 4.9...5.1  
 Del.quantity cm3/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 2.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1230  
 Del.quantity : 97.0...99.0  
 1000 : (95.0...101.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 94...102

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 10.5

Speed rpm : 1270...1275 \*  
2nd rack travel in: 4.00  
Speed rpm : 1295...1310  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 74...82  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 5.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 750  
Rack travel in mm : 4.90...5.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 85.0...89.0  
1000 s: (83.0...91.0)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 4.90...5.10  
Del.quantity cm<sup>3</sup>/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

\* Read off speed set under 1.  
Add 25...35 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 66  
 Edition : 21.08.92  
 Replaces : 04.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 070  
 Injection pump  
 Pump designation : PES6MW100/720RS1172  
 EP type number : 0 413 406 155  
 Governor  
 Governor design. : RSV350...1300MWA329  
 -4  
 Governor no. : 0 420 085 116

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 170.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 19.00...21.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.70...14.80

Del.quantity cm3/ : 10.8...11.0

100 s: (10.6...11.2)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.9...6.1

Del.quantity cm3/ : 1.0...1.4

100 s: (0.7...1.6)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 108.0...110.0

1000 : (106.0...112.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 96...104

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.70

Speed rpm : 1330...1340

2nd rack travel in: 4.00

Speed rpm : 1410...1440  
4th rack travel in: 1500  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 62...70  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

#### Testing:

Speed rpm : 100  
Minimum rack travel: 7.60  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.70...11.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 12.60...12.80  
2nd pressure hPa : 500  
Rack travel in m: 13.70...13.90  
3rd pressure hPa : 1000  
Rack travel in m: 14.70...14.80

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 900  
Del.quantity cm3/ : 101.0...104.0  
1000 s: (98.5...106.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 42.0...44.0  
1000 s: (40.0...46.0)  
Spread cm3 : 3.50  
1000 s: (6.00)

#### BREAKAWAY

N08

1st version  
1mm rack travel less than

full load rack tr: 13.70  
Speed rpm : 1330...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 72  
 Edition : 21.08.92  
 Replaces : 08.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 072  
 Injection pump  
 Pump designation : PES6MW100/72ORS1172-  
 1  
 EP type number : 0 413 406 166  
 Governor  
 Governor design. : RSV350...1300MWOA329  
 -5  
 Governor no. : 0 420 085 119

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 184.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)  
 Rack travel in mm : 19.00...21.00  
 firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 15.40...15.50

Del.quantity cm3/ : 12.2...12.4

100 s: (12.0...12.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.9...6.1  
 Del.quantity cm3/ : 1.0...1.4  
 100 s: (0.7...1.6)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 4.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1280  
 Aneroid pressure h: 1500  
 Del.quantity : 122.0...124.0  
 1000 : (120.0...126.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 98...106

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 14.40  
Speed rpm : 1330...1340  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1580  
Speed rpm : 0.30...1.70

LOW IDLE 1

Control lever  
position degrees: 67...75  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.0

Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.90...6.10

SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.00...11.10

Measurement

Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 12.90...13.10  
2nd pressure hPa : 650  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1500  
Rack travel in m: 15.40...15.50

FUEL DELIVERY CHARACTERISTICS

1st version

Aneroid pressure h: 1500  
Speed rpm : 800  
Del.quantity cm3/ : 113.5...116.5  
1000 s: (111.0...119.0)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 33.0...35.0  
1000 s: (31.0...37.0)

BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 14.40  
Speed rpm : 1330...1340

STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 105.0...115.0  
1000 s: (102.0...118.0)

LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.90...6.10  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 75  
 Edition : 21.08.92  
 Replaces : 11.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 075  
 Injection pump  
 Pump designation : PES6MW100/720RS1130  
 EP type number : 0 413 406 122  
 Governor  
 Governor design. : RSV350...750MWA336-4  
 Governor no. : 0 420 085 160

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM366A

1st version kW : 84.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700  
 Rack travel in mm : 12.00. .12.10  
 Del.quantity cm3/ : 8.0...8.2  
 100 s: (7.8...8.4)  
 Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.8...6.8  
 Del.quantity cm3/ : 0.9...1.3  
 100 s: (0.6...1.5)  
 Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 2.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 700  
 Del.quantity : 80.0...82.0  
 1000 : (78.0...84.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 74...82

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 11.0

Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 850  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 61...69  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.3

#### Testing:

Speed rpm : 100  
Minimum rack trave: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.80...6.80

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.0  
Speed rpm : 750...755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.80  
Del.quantity cm3/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm3 : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 25...35 min-1 to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Observe VDT-I-420/120

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 D 74  
 Edition : 21.08.92  
 Replaces : 11.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 078  
 Injection pump  
 Pump designation : PES6MW100/720RS1129  
 EP type number : 0 413 406 121  
 Governor  
 Governor design. : RSV350...750MWOA336-3  
 Governor no. : 0 420 085 159

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kw : 94.0  
 Rated speed : 1500

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.70...3.80  
 : (3.65...3.85)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 700

Rack travel in mm : 12.50...12.60

Del.quantity cm3/ : 8.5...8.7

100 s: (8.3...8.9)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 5.8...6.8

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.80

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 700

Del.quantity : 85.0...87.0

1000 : (83.0...89.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 74...82

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 11.5

Speed rpm : 750...755 \*  
2nd rack travel in: 4.00  
Speed rpm : 775...788  
4th rack travel in: 850  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 60...68  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.3

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.80...6.80

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### BREAKAWAY

1st version  
1mm rack travel less than

full load rack tr: 11.5  
Speed rpm : 750..755

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 88.0...98.0  
1000 s: (85.0...101.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.80...6.80  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.50)

Remarks:

:

\* Read off speed set under 1.  
Add 25...35 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

Observe VDT-I-420/120

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 H  
Edition : 21.08.92  
Replaces : 03.90  
Test oil : ISO-4113  
Combination no. : 0 403 476 079  
Injection pump  
Pump designation : PES6MW100/720RS1191  
EP type number : 0 413 406 179  
Governor  
Governor design. : RSV750...1250MWA325  
-3  
Governor no. : 0 420 085 129

Customer-spec. information  
Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 162.0  
Rated speed : 2500

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
x Wall thickness  
x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
: (3.45...3.65)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1230

Rack travel in mm : 13.90...14.00

Del.quantity cm3/ : 11.4...11.6

100 s: (11.2...11.8)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 750.0

Rack travel in mm : 5.2...6.0

Del.quantity cm3/ : 1.5...1.9

100 s: (1.2...2.1)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 2.30

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1230

Del.quantity : 114.0...116.0

1000 : (112.0...118.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 88...96

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 12.9

Speed rpm : 1270...1275 \*  
2nd rack travel in: 4.00  
Speed rpm : 1295...1310  
4th rack travel in: 1350  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 72...80  
Setting point w/out bumper spring  
Speed rpm : 750  
Rack travel in mm : 5.6

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 750  
Rack travel in mm : 5.20...6.00

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

#### FUEL DELIVERY CHARACTERISTICS

##### 1st version

Speed rpm : 750  
Del.quantity cm3/ : 106.0...109.0  
1000 s: (103.5...111.5)  
Spread cm3 : 5.00  
1000 s: (7.0)

#### BREAKAWAY

##### 1st version

1mm rack travel less than

full load rack tr: 12.9  
Speed rpm : 1270...1275

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 95.0...105.0  
1000 s: (92.0...108.0)

#### LOW IDLE

Speed rpm : 750  
Rack travel in mm : 5.20...6.00  
Del.quantity cm3/ : 15.0...19.0  
1000 s: (12.5...21.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

:

\* Read off speed set under 1.  
Add 25...35 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 H 1  
 Edition : 21.08.92  
 Replaces : 05.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 080  
 Injection pump  
 Pump designation : PES6MW100/720RS1191  
 EP type number : 0 413 406 179  
 Governor  
 Governor design. : RSV350...1300MWOA329  
 -6  
 Governor no. : 0 420 085 136

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 170.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 14.00...14.10

Del.quantity cm3/ : 11.2...11.4

100 s: (11.0...11.6)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 6.0...6.2

Del.quantity cm3/ : 0.9...1.3

100 s: (0.6...1.5)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1280

Aneroid pressure h: 1000

Del.quantity : 112.0...114.0

1000 : (110.0...116.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 105...113

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.0

Speed rpm : 1330...1335 \*

2nd rack travel in: 4.00

Speed rpm : 1410...1423  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.1

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.00...6.20

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

##### Setting

Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 10.10...10.20

##### Measurement

Speed 1/min : 500

1st pressure hPa : 350  
Rack travel in m: 11.30...11.40  
2nd pressure hPa : 500  
Rack travel in m: 12.40...12.70  
3rd pressure hPa : 1000  
Rack travel in m: 14.00...14.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del. quantity cm<sup>3</sup>/ : 101.0...104.0  
1000 s: (98.5...106.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del. quantity cm<sup>3</sup>/ : 35.0...37.0  
1000 s: (33.0...39.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 13.0  
Speed rpm : 1330...1335

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del. quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.00...6.20  
Del. quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

\* Read off speed set under 1.  
Add 80...88 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE 8,4 D  
 Edition : 03.12.92  
 Replaces : 07.92  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 081  
 Injection pump  
 Pump designation : PES6MW100/720RS1196-1  
 EP type number : 0 413 406 219  
 Governor  
 Governor design. : RSV350...1050MWA338  
 Governor no. : 0 420 085 138

Customer-spec. information  
 Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0  
 Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve  
 : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
 x Wall thickness  
 x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
 : (3.35...3.55)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 13.6...13.8

100 s: (13.4...14.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.3...8.7

Del.quantity cm3/ : 7.1...7.5

100 s: (6.8...7.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: ~3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1300

Del.quantity : 136.0...138.0

1000 : (134.0...140.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1125...1145  
3rd rack travel in: 4.00  
Speed rpm : 1160...1180  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.50...5.90

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.30  
3rd speed rpm : 800  
Rack travel in m: 11.20...11.30  
5th speed rpm : 400  
Rack travel in m: 12.60...12.70

#### Aneroid/Altitude Compensator Test

#### 1st version

##### Setting

Speed rpm : 550  
Pressure hPa : -  
Rack travel in mm : 10.40...10.60

##### Measurement

Speed 1/min : 550

1st pressure hPa : 390  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 520  
Rack travel in m: 11.00...11.20  
3rd pressure hPa : 1300  
Rack travel in m: 11.20...11.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1300  
Speed rpm : 500

Del.quantity cm3/ : 136.0...139.0  
1000 s: (133.5...141.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1300  
Speed rpm : 800  
Del.quantity cm3/ : 135.0...138.0  
1000 s: (132.5...140.5)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (118.0...124.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 127.0...137.0  
1000 s: (124.0...140.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 8.30...8.70  
Del.quantity cm3/ : 71.0...75.0  
1000 s: (68.5...77.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

#### Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : LIE  
Edition : 03.12.92  
Replaces : -  
Test oil : ISO-4113  
Combination no. : 0 403 476 081A  
Injection pump  
Pump designation : PES6MW100/720RS1196-1  
EP type number : 0 413 406 219  
Governor  
Governor design. : RSV350...1050MWOA338  
Governor no. : 0 420 085 138

Customer-spec. information  
Customer : LIEBHERR

Engine : D 916 T

1st version kW : 170.0  
Rated speed : 2100

## TEST BENCH REQUIREMENTS

Test oil  
inlet temp. °C : 38...42

Overflow valve : 1 417 413 049

Inlet press., bar : 1.50

Test nozzle holder  
assembly : 0 681 343 009

Opening  
pressure, bar : 172...175

Test lines : 1 680 750 008

Outside diameter  
x Wall thickness  
x Length mm : 6.00X2.00X600

(A) Injection pump setting values  
Insp. values in parentheses  
Set equal delivery quant.  
per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.40...3.50  
: (3.35...3.55)

Rack travel in mm : 9.00...12.00  
Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1050

Rack travel in mm : 11.20...11.30

Del.quantity cm3/ : 13.6...13.8

100 s: (13.4...14.0)

Spread cm3 : 0.3

100 s: (0.6)

2nd speed rpm : 350.0

Rack travel in mm : 8.3...8.7

Del.quantity cm3/ : 7.1...7.5

100 s: (6.8...7.7)

Spread cm3 : 0.3

100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position

Degree: -3

Speed rpm : 800

Rack travel in mm : 0.30...1.00

Governor spring pre-tension

Click setting x : 5.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version

Speed rpm : 1050

Aneroid pressure h: 1300

Del.quantity : 136.0...138.0

1000 : (134.0...140.0)

Spread cm3 : 3.50

1000 : (6.00)

## RATED SPEED

1st version

Control lever

position degrees: 98...106

Setting point:

Speed rpm : 800

Rack travel in mm : 0.6

Testing:

1st rack travel in: 10.20  
Speed rpm : 1070...1080  
2nd rack travel in: 4.00  
Speed rpm : 1125...1145  
3rd rack travel in: 4.00  
Speed rpm : 1160...1180  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 70...78  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.7

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.50...5.90

#### TORQUE CONTROL

Torque control curve - 1st version  
1st speed rpm : 1050  
Rack travel in m: 11.20...11.30  
2nd speed rpm : 500  
Rack travel in m: 11.20...11.30  
3rd speed rpm : 800  
Rack travel in m: 11.20...11.30  
5th speed rpm : 400  
Rack travel in m: 12.60...12.70

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 550  
Pressure hPa : -  
Rack travel mm : 10.40...10.60

#### Measurement

Speed 1/min : 550

1st pressure hPa : 390  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 520  
Rack travel in m: 11.00...11.20  
3rd pressure hPa : 1300  
Rack travel in m: 11.20...11.30

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1300  
Speed rpm : 500

Del.quantity cm3/ : 136.0...139.0  
1000 s: (133.5...141.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: 1300  
Speed rpm : 800  
Del.quantity cm3/ : 135.0...138.0  
1000 s: (132.5...140.5)  
Aneroid pressure h: -  
Speed rpm : 550  
Del.quantity cm3/ : 120.0...122.0  
1000 s: (118.0...124.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 10.20  
Speed rpm : 1070...1080

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 127.0...137.0  
1000 s: (124.0...140.0)  
Rack travel in mm : 19.50...21.00

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 8.30...8.70  
Del.quantity cm3/ : 71.0...75.0  
1000 s: (68.5...77.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

Check electrically unlatched starting  
fuel delivery (EES) with 24 volt.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 L  
 Edition : 21.08.92  
 Replaces : 08.90  
 Test oil : ISO-4113

Combination no. : 0 403 476 085

Injection pump  
 Pump designation : PES6MW100/720RS1205  
 EP type number : 0 413 406 195  
 Governor  
 Governor design. : RSV350...1300MWA329  
 -7  
 Governor no. : 0 420 085 142

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 184.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42

Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

## BEGINNING OF DELIVERY

Test pressure, bar: 30...32

Prestroke mm : 3.20...3.30  
 : (3.15...3.35)

N23

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280

Rack travel in mm : 15.50...15.60

Del.quantity cm3/ : 12.8...13.0  
 100 s: (12.6...13.2)

Spread cm3 : 0.3  
 100 s: (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 6.3...6.5  
 Del.quantity cm3/ : 1.0...1.4  
 100 s: (0.7...1.6)

Spread cm3 : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3

Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 3.75

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1280  
 Aneroid pressure h: 1200  
 Del.quantity : 128.0...130.0  
 1000 : (126.0...132.0)

Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 96...104

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 14.50  
Speed rpm : 1330...1340  
2nd rack travel in: 4.00  
Speed rpm : 1420...1450  
4th rack travel in: 1580  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 65...73  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 6.30...6.50

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.30...11.40

#### Measurement

Speed 1/min : 500

1st pressure hPa : 450  
Rack travel in m: 12.70...12.90  
2nd pressure hPa : 650  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1200  
Rack travel in m: 15.50...15.60

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1200  
Speed rpm : 800  
Del.quantity cm3/ : 122.0...125.0  
1000 s: (119.5...127.5)  
Spread cm3 : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm3/ : 48.0...50.0  
1000 s: (46.0...52.0)

#### BREAKAWAY

N24

#### 1st version

1mm rack travel less than

full load rack tr: 14.50  
Speed rpm : 1330...1340

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm3/ : 110.0...120.0  
1000 s: (107.0...123.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 6.30...6.50  
Del.quantity cm3/ : 10.0...14.0  
1000 s: (7.5...16.5)  
Spread cm3 : 3.50  
1000 s: (5.00)

Remarks:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 H 2  
 Edition : 21.08.92  
 Replaces : 08.90  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 086  
 Injection pump  
 Pump designation : PES6MW100/720RS1191  
 EP type number : 0 413 406 179  
 Governor  
 Governor design. : RSV425...1000MWA329  
 -8  
 Governor no. : 0 420 085 143

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 151.0  
 Rated speed : 2000

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300

Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 980  
 Rack travel in mm : 14.90...15.00  
 Del. quantity cm<sup>3</sup>/ : 11.0...11.2  
 100 s: (10.8...11.4)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.6)

2nd speed rpm : 425.0  
 Rack travel in mm : 6.3...6.5  
 Del. quantity cm<sup>3</sup>/ : 0.9...1.3  
 100 s: (0.6...1.5)  
 Spread cm<sup>3</sup> : 0.3  
 100 s: (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

Governor spring pre-tension  
 Click setting x : 3.50

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 980  
 Aneroid pressure h: 1000  
 Del. quantity : 110.0...112.0  
 1000 : (108.0...114.0)  
 Spread cm<sup>3</sup> : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 86...94

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:

1st rack travel in: 13.90  
Speed rpm : 1030...1040  
2nd rack travel in: 4.00  
Speed rpm : 1100...1130  
4th rack travel in: 1250  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 68...76  
Setting point w/out bumper spring  
Speed rpm : 425  
Rack travel in mm : 6.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 425  
Rack travel in mm : 6.30...6.50

SET IDLE AUXILIARY SPRING  
Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 11.70...11.80

#### Measurement

Speed 1/min : 500

1st pressure hPa : 200  
Rack travel in m: 12.60...12.80  
2nd pressure hPa : 350  
Rack travel in m: 13.90...14.10  
3rd pressure hPa : 1000  
Rack travel in m: 14.90...15.00

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 103.0...106.0  
1000 s: (100.5...108.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 50.0...52.0  
1000 s: (48.0...54.0)

#### BREAKAWAY

N26

1st version  
1mm rack travel less than

full load rack tr: 13.90  
Speed rpm : 1030...1040

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 425  
Rack travel in mm : 6.30...6.50  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

# BOSCH INJ. PUMP TEST SPECIFICATIONS

## Note remarks

Test sheet : MB 6,0 H 3  
 Edition : 21.08.92  
 Replaces : 05.91  
 Test oil : ISO-4113  
 Combination no. : 0 403 476 093  
 Injection pump  
 Pump designation : PES6MW100/720RS1191  
 EP type number : 0 413 406 179  
 Governor  
 Governor design. : RSV350...1300MWOA329  
 -9  
 Governor no. : 0 420 085 151

Customer-spec. information  
 Customer : MB-NFZ

Engine : OM 366 LA

1st version kW : 155.0  
 Rated speed : 2600

## TEST BENCH REQUIREMENTS

Test oil  
 inlet temp. °C : 38...42  
 Overflow valve : 1 419 992 198

Inlet press., bar : 1.50

Test nozzle holder  
 assembly : 0 681 343 009

Opening  
 pressure, bar : 172...175

Test lines : 1 680 750 089

Outside diameter  
 x Wall thickness  
 x Length mm : 8.00X2.50X600

(A) Injection pump setting values  
 Insp. values in parentheses  
 Set equal delivery quant.  
 per values \_\_\_\_\_

BEGINNING OF DELIVERY  
 Test pressure, bar: 30...32

Prestroke mm : 3.50...3.60  
 : (3.45...3.65)

Rack travel in mm : 9.00...12.00  
 Firing order : 1- 5- 3- 6- 2- 4

Phasing : 0-60-120-180-240-300  
 Tolerance + - ° : 0.50 (0.75)

## BASIC SETTING

1st speed rpm : 1280  
 Rack travel in mm : 12.00...12.10  
 Del.quantity cm3/ : 9.8...10.0  
 100 s : (9.6...10.2)  
 Spread cm3 : 0.3  
 100 s : (0.6)

2nd speed rpm : 350.0  
 Rack travel in mm : 5.3...5.5  
 Del.quantity cm3/ : 0.9...1.3  
 100 s : (0.6...1.5)  
 Spread cm3 : 0.3  
 100 s : (0.5)

## GUIDE SLEEVE POSITION

Control-lever position  
 Degree: -3  
 Speed rpm : 800  
 Rack travel in mm : 0.30...1.00

## FULL LOAD DELIV. AT FULL LOAD STOP

1st version  
 Speed rpm : 1280  
 Aneroid pressure h: 1000  
 Del.quantity : 98.0...100.0  
 1000 : (96.0...102.0)  
 Spread cm3 : 3.50  
 1000 : (6.00)

## RATED SPEED

1st version  
 Control lever  
 position degrees: 105...113

Setting point:  
 Speed rpm : 800  
 Rack travel in mm : 0.6

Testing:  
 1st rack travel in: 11.0  
 Speed rpm : 1330...1335 \*  
 2nd rack travel in: 4.00

Speed rpm : 1410...1423  
4th rack travel in: 1550  
Speed rpm : 0.30...1.70

#### LOW IDLE 1

Control lever  
position degrees: 75...83  
Setting point w/out bumper spring  
Speed rpm : 350  
Rack travel in mm : 5.4

#### Testing:

Speed rpm : 100  
Minimum rack travel: 19.00  
Speed rpm : 350  
Rack travel in mm : 5.30...5.50

#### SET IDLE AUXILIARY SPRING

Rack travel in mm : 2.00

Aneroid/Altitude  
Compensator Test

#### 1st version

Setting  
Speed rpm : 500  
Pressure hPa : -  
Rack travel mm : 9.00...9.10

#### Measurement

Speed 1/min : 500

1st pressure hPa : 300  
Rack travel in m: 10.60...10.70  
2nd pressure hPa : 380  
Rack travel in m: 11.20...11.50  
3rd pressure hPa : 1000  
Rack travel in m: 12.00...12.10

#### FUEL DELIVERY CHARACTERISTICS

#### 1st version

Aneroid pressure h: 1000  
Speed rpm : 600  
Del.quantity cm<sup>3</sup>/ : 85.0...88.0  
1000 s: (82.5...90.5)  
Spread cm<sup>3</sup> : 5.00  
1000 s: (7.0)  
Aneroid pressure h: -  
Speed rpm : 500  
Del.quantity cm<sup>3</sup>/ : 35.0...37.0  
1000 s: (33.0...39.0)

#### BREAKAWAY

#### 1st version

1mm rack travel less than

full load rack tr: 11.0  
Speed rpm : 1330...1335

#### STARTING FUEL DELIVERY

Speed rpm : 100  
Del.quantity cm<sup>3</sup>/ : 100.0...110.0  
1000 s: (97.0...113.0)

#### LOW IDLE

Speed rpm : 350  
Rack travel in mm : 5.30...5.50  
Del.quantity cm<sup>3</sup>/ : 9.0...13.0  
1000 s: (6.5...15.5)  
Spread cm<sup>3</sup> : 3.50  
1000 s: (5.00)

Remarks:

:

Test hydr. locking device for starting  
with 500...1000 hPa air pressure.

\* Read off speed set under 1.  
Add 80...88 min<sup>-1</sup> to this speed. The  
control-rod travel under 2. must be  
attained with the calculated speed  
profile.